JANUARY, 1958

Commercial Fertilizer

and PLANT FOOD INDUSTRY

EFFICIENT OPERATION PAYS IN MIXING GRANULAR GOODS

SEE PAGE 19

Advertisement of NITROGEN DIVISION, ALLIED CHEMICAL

QUIZ
For Multiwall Bag Buyers

"How Does Your Packaging Operation Rate?"

1 Is your bag correctly sized for your product?
2 Is your bag properly constructed for your product?
3 If loss of product is caused by deterioration, would special protective sheets help to reduce such loss?
4 Is the total cost of your bag out of proportion to the selling price of your product?
5 Does your product cost warrant redesigning your bag to merchandise your product more effectively?
6 Are you using the most economical filling machine available for packaging?
7 Are your current suppliers giving you the service you desire?
8 Are your suppliers integrated and capable of maintaining dependable service at all times, under all conditions?
9 Are your suppliers' representatives qualified to help you with your packaging, sales promotion and marketing?

Perhaps we may be able to help you to arrive at the right answers in order to achieve higher production at lower costs.

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary

630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.

Plants at St. Marys, Ga. and Gilman, Vt.

Sales Agents for The **Kraftpacker** Open Mouth Bag Filling Machine

Gilman PAPER CO.
- St. Marys Kraft Corp.
- Gummed Tape Div.
- The Gilmanized Corp.
- Kraft Bag Corp.

☐ O.K. Kraft... Help me to answer your Quiz. Please have representative call. CF

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

PRODUCT MFD._____

NAME_____

For QUALITY that SHOWS

Nutronite

(Smirow)

..and quality you can *talk* about!

NUTRONITE IS THE QUALITY, NATURAL ORGANIC SUPPLEMENT TO CHEMICAL PLANT FOODS

Nutronite (formerly Smirow) adds to the selling power of your mixed fertilizers. Plainly visible Nutronite assures your customers of added growth and profits . . . brings back satisfied customers year after year.

Nutronite is the 100 percent natural organic addition to mixed fertilizers. Its nitrogen is 90% water insoluble and 90% available—for that all-season effect on plant growth.

Nutrition + Nitrogen = Nutronite

Let us figure the cost of Nutronite delivered to your plant.

SMITH NUTRONITE ROWLAND

SMITH-ROWLAND CO.

P. O. Box 1219, Norfolk 1, Va.

A DIVISION OF SMITH-DOUGLASS COMPANY, INCORPORATED

TO BETTER SERVE OUR CUSTOMER—

U. S. PHOSPHORIC PRODUCTS

P. O. BOX 55251
UPTOWN STATION
Indianapolis 5, Indiana
Phone: WAlnut 3-5477

We have established in Indianapolis, Indiana, a Customers' Relation and Technical Service Department to work closely with our sales agent, Bradley & Baker to better serve the Fertilizer Industry. Our Technical and Customer service personnel are at your service to assist in anyway possible to bring about a smoother, more efficient operation in your fertilizer processing.

TRIPLE SUPERPHOSPHATE

ONE SOURCE FOR ALL THREE

RUN-OF-PILE
GRANULAR
COARSE

There's a BRADLEY & BAKER Office near you. Their representative would be pleased to consult with you on your requirements and to advise on your most convenient delivery routings.

AREA OFFICES

Atlanta, Georgia
Phone: Trinity 6-4393

St. Louis, Missouri
Phone: Parkview 7-8166

Norfolk, Virginia
Phone: Madison 2-2708

U.S. PHOSPHORIC PRODUCTS
TAMPA FLORIDA
Division
TENNESSEE TC CORPORATION

BRADLEY & BAKER
Sales Agents
155 East 44th Street — New York 17, N. Y.
Phone: Murray Hill 2-5325

Published Monthly by
WALTER W. BROWN PUBLISHING CO., INC.
75 Third St., N. W., Atlanta 8, Ga.
Phone TRinity 4-4160

Address all inquiries, advertising and editorial material, and correspondence to Atlanta Publishing Offices, sending direct to COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, 75 Third St. N. W., Atlanta 8, Georgia.

President
ERNEST H. ABERNETHY

Editor
CLAY W. PENICK, JR.

Associate Editor
BRUCE MORAN

Business Manager
V. T. CRENSHAW

Chicago Representative
ELON A. ABERNETHY
1753 Howard St.—Room 200
Chicago 26, Illinois
Phone Rogers Park 4-5616

West Coast Representative
M. A. CALDWELL
2267 W. 24th St., Los Angeles, Cal.
Phone REPUBLIC 1-3050

Vol. 96 No. 1 *Established 1910* January, 1958

Commercial Fertilizer
and PLANT FOOD INDUSTRY

Subscription rates: United States, $3.00 per year; 5 years, $12.00. Foreign $5.00 per year.

Contents

Just Around the Corner, by *Vernon Mount* 10
You Can't Eat It—So Sell It 24
Preliminary 1956-57 Consumption Report by *Scholl, Crammatte & Davis* 28
Factors Influencing Farm Fertilizer Buying 32
Cotton Conference Topics of Fertilizer Interest 33
New Tennessee Farmers Co-op Plant 36
Around the Map 39
Field Experiments Prevent Waste, by *V. Sauchelli* 40
A New Look at an Old Feud, by *W. F. Price* 42
Research Results & Reports 46
Markets & Staff Tonnage Figures 51
Industry Calendar 51
Personals 52
Changes 53
California Conference Plans 56
Classified Advertising 58
Index to Advertisers 58

COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, entered as second class matter, October 12, 1910, at the post office at Atlanta, under the Act of March 3, 1879. Published monthly except semi-monthly in September, by Walter W. Brown Publishing Co., Inc., 75 Third St., N. W., Atlanta 8, Georgia.

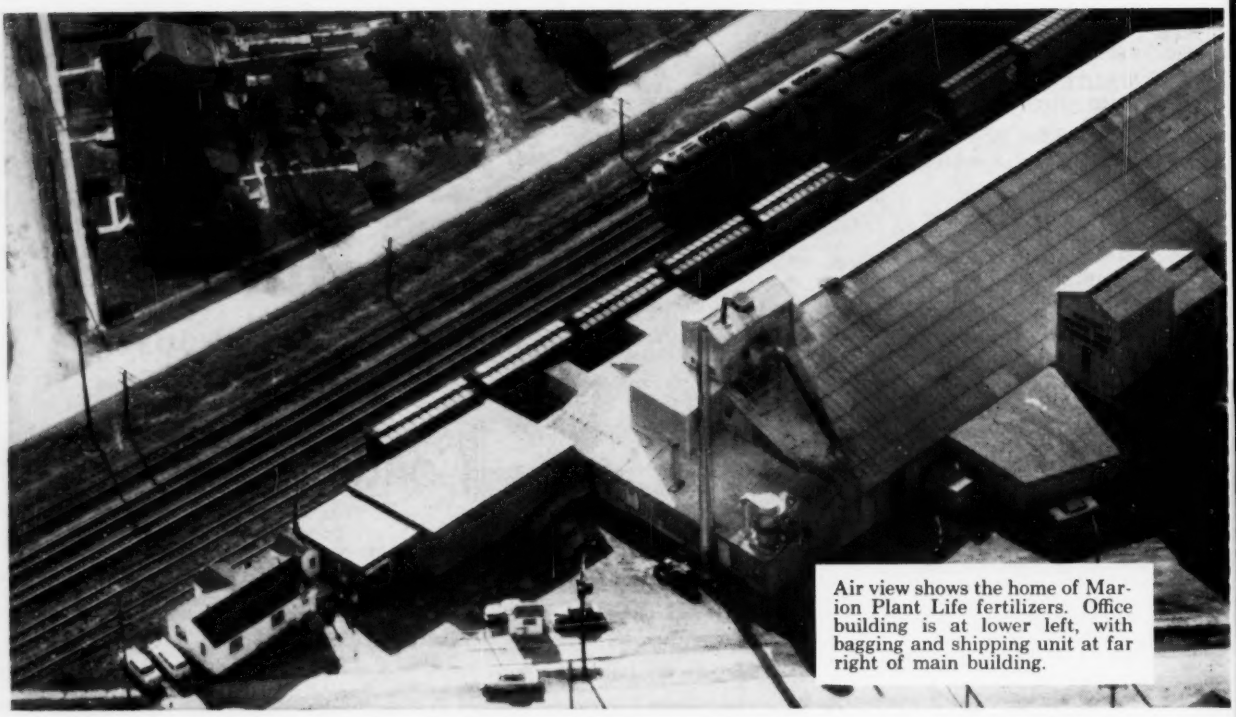
Commenting Freely

by BRUCE MORAN

A problem that must be faced one of these days—and the time is not as far off as you may think—is how to make the transition between marginal farms and the farmers going into cooperative or business-managed farms—or moving away from the farm entirely. While there is no doubt that farming is going to be a lot more important as we edge toward that 200 million populations,—will all the present farmers be needed to carry on. Or will the more efficient farmer and mechanization cut the list sharply?

We are concerned with it because everything that affects the land affects the fertilizer manufacturer. That is our place in the social scheme, just as much as it is in the economic scheme. And while it would be easier to turn our backs while the marginal farmer goes through his agony, it is something we just cannot do to customers of the past and perhaps of the future.

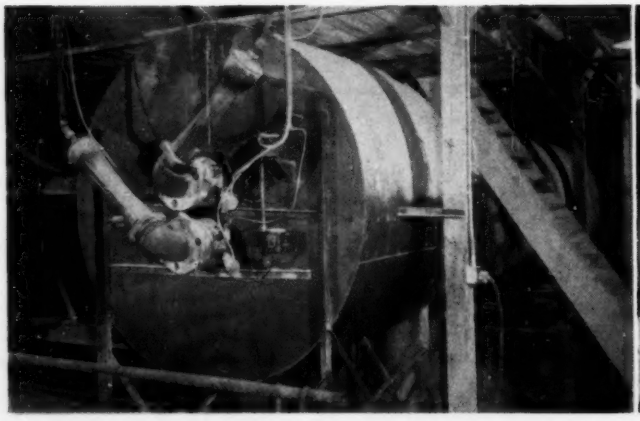
It is one of the many things we should be thinking about in this Year of Change, 1958.



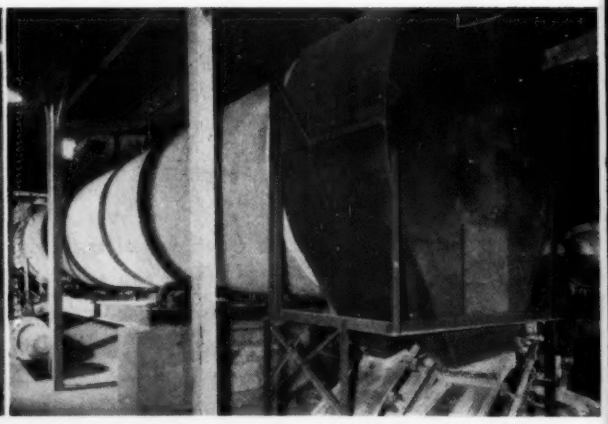
Air view shows the home of Marion Plant Life fertilizers. Office building is at lower left, with bagging and shipping unit at far right of main building.

"We've found 4 big reasons for choosing International's Triple"

- √ **ammoniates well**
- √ **high analysis triple—costs less per unit P_2O_5**
- √ **makes a very satisfactory granular product**
- √ **dependable service**



Compact arrangement of plant features combustion unit in foreground with continuous-type ammoniator-granulator located above.



Drying and cooling units are located at ground level. Dryer extending from left is paralleled by a cooler located at the rear.

President George H. Alber supervises activities from this attractive office.

"That's why we schedule
International's Triple Super"

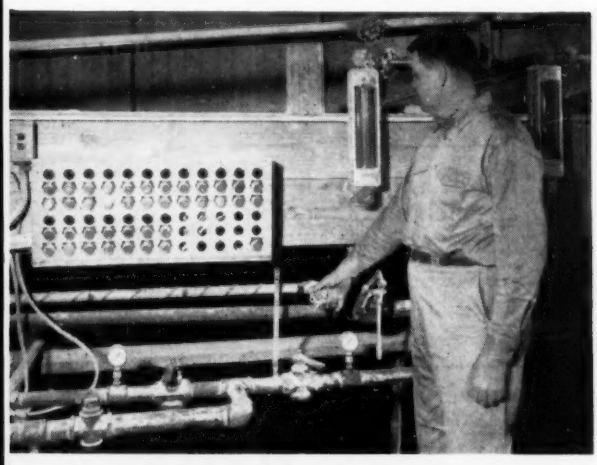
says George H. Alber, President, Marion Plant Life Fertilizer Co., Marion, Ohio

People around Marion, Ohio, regard George H. Alber as an "unofficial pace-setter" for the fertilizer trade in that area. He organized the Marion Plant Life Fertilizer Co. in 1937 and serves as president of the company. In 1955 he switched all plant operations to granular fertilizers.

"We know what we're looking for in basic goods," says Alber. "Every ingredient must measure up to top quality standards. That's why we schedule International's Triple."

There's no secret about the choice. "We like the way it ammoniates . . . and the granular product we get. It's a high-grade phosphate that costs less per unit. And we can count on dependable service and delivery, any time."

These same benefits can be yours when you use International's superior quality Triple Super. Write or wire for full information.



Control panel operated by Plant Superintendent Fred Ioerger is located near ammoniator-granulator. Three men, including one man at controls, and foreman keep plant operating when "on stream."

INTERNATIONAL MINERALS *International* MINERALS CHEMICALS **& CHEMICAL CORPORATION**

PHOSPHATE CHEMICALS DIVISION . . . . . 20 N. WACKER DRIVE, CHICAGO 6, ILL.

New from Du Pont...

UAL-S

A Uramon® Ammonia Liquor containing ammonium sulfate for improved manufacturing and agronomic properties

Now, Du Pont offers a "Uramon" Ammonia Liquor containing ammonium sulfate. This new urea-ammonia solution, called UAL-S, combines two efficient forms of nitrogen with ammonium sulfate to provide added sulfur . . . an essential plant nutrient with recognized agronomic value.

All fertilizers benefit from nitrogen derived from UAL-S. Regular mixtures cure well, are free-flowing and resist caking. In granular mixtures, UAL-S aids in producing good yields of hard, round, firm granules that store and distribute well.

UAL-S is safe—handles at moderate pressure and there's no danger of flash fires. It's non-corrosive to fertilizer manufacturing equipment, including mild steel and aluminum. UAL-S has a low freezing point, too . . . can be stored year round in most areas.

Du Pont specialists can give you at-the-plant advice on proper use of UAL-S in your fertilizer mixtures. They stand ready to assist you in profitably formulating mixtures containing UAL-S. For further information on UAL-S, and to request the services of one of Du Pont's specialists, write the nearest office.

E. I. DU PONT DE NEMOURS & CO. (INC.)
POLYCHEMICALS DEPARTMENT
WILMINGTON 98, DELAWARE

District Offices:

1616 Walnut Street
Philadelphia 3, Pa.

7250 N. Cicero Avenue
Chicago 30, Illinois

DU PONT
REG. U.S. PAT. OFF.

URAMON®
AMMONIA LIQUORS

25 ANNIVERSARY UAL SOLUTIONS

Du Pont UAL solutions in mixed fertilizers have helped American farmers grow better crops for 25 years.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

S·P·M
PREMIUM
Premium quality fertilizer certified through use of a balanced combination of the water-soluble magnesium and potash obtained from
Sul·Po·Mag®
SULPHATE OF POTASH MAGNESIA
Reg. Trade Mark I. M. & C. Corp., Chicago

Include Sul-Po-Mag in your premium fertilizer—and display the SPM seal. The SPM seal can be displayed on bags and tags, in dealers' and manufacturers' displays, and in newspaper advertising.

Use this seal to increase sales ...before it's

TOO LATE for TOP PROFITS

Your premium fertilizer is *pre-sold* through advertising to *more than a million potential customers* when bags carry the Sul-Po-Mag seal. Your potential customers are presented with the facts: (1) how indications of magnesium deficiency —yellowing between the veins of leaves—mean top profits are lost; (2) how Sul-Po-Mag®, made by International Minerals and Chemical Corporation, can make fast-acting, water-soluble magnesium readily available to plants before it's *too late for top profits;* and (3) how the SPM seal guarantees that your premium fertilizer contains Sul-Po-Mag.

Use the SPM seal to help make sales for you . . . *now* . . . before it's TOO LATE for TOP PROFITS. See how it can bring in new pre-sold customers who will find that it pays, in bigger yields and higher quality crops, to buy your premium fertilizer containing Sul-Po-Mag.

SPM consumer advertising is aimed *specifically* to growers of citrus fruit, deciduous fruit, small fruit, vegetables, tobacco, potatoes, cotton, and many other crops . . . to potential customers in your trade area. Use SPM *pre-selling* . . . before it's TOO LATE for TOP PROFITS.

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

POTASH DIVISION . . . . . 20 N. WACKER DRIVE, CHICAGO 6, ILL.

JUST AROUND THE CORNER *by Vernon Mount*

HYSTERIA seems to be an America failing. But so is APATHY. We go from one extreme to the other. The Sputnik thing is a case in point. Hysterics will get nothing done. Political raving and ranting can hardly speed up a program that demands the most careful, thoughtful, scientific approach. And such an atmosphere can hardly be conducive to good, sound progress in the field of long range missile development.

EXTREMES of sentiment over such items as whether or not to publicize don't help, either. Because there was public pressure on the secrecy of the missile program, we went the other way – and had a press-agent's holiday over Flopnik. The public now realizes the harm such horn-blowing has done us abroad, – and silence has again settled around the launching sites.

WE'LL MAKE IT, never fear. And we have more than we admit. When we make it, we'll tell it.

Yours faithfully,

Vernon Mount

Are you planning to install or repair a

NITROGEN SOLUTION SYSTEM

You ought to know Joe

Call, Write or Wire JOE NAYLOR
V. P. at J. M. TULL METAL & SUPPLY CO., INC.

FOR 20 YEARS Joe has been on the job analyzing and correctly specifying your Nitrogen Solution Fitting requirements. He will keep you out of trouble in assembling your Nitrogen Solution equipment and insure your securing the right type and amount of material to do the job correctly.

SEND FOR BOOKLET "The Installation and Operation of a Nitrogen Solution System" to P. O. Box 4628, Atlanta 2, Georgia.

J. M. TULL METAL & SUPPLY COMPANY, INC.

285 Marietta St., N. W. **JAckson 5-3871** **ATLANTA 2, GA.**

Branch Warehouses

BIRMINGHAM **JACKSONVILLE** **MIAMI** **TAMPA**

"Ah eat like a hawg... when it's corn grown in potash-enriched soil!"

FERTILIZER MANUFACTURERS—you can count on the United States Potash Company for know-how and experience in the production of potash. USP now offers 3 outstanding grades. USP's Higran and Higrade muriate (both white, both with 62/63% K_2O) are the purest agricultural muriates now available. USP's Granular muriate of potash (pink-red) contains 60% K_2O. All three grades are non-caking and free-flowing throughout.

Our Technical Service Department welcomes your inquiries.

UNITED STATES POTASH COMPANY
DIVISION OF UNITED STATES BORAX & CHEMICAL CORPORATION
50 Rockefeller Plaza, New York 20, New York
Southern Sales Office: Rhodes-Haverty Building, Atlanta, Georgia

SUNSHINE STATE POTASH A PRODUCT OF NEW MEXICO U.S.A.
REG. U. S. PAT. OFF.

MEMBER: AMERICAN POTASH INSTITUTE

Complete **GRANULATION UNITS** Turn-Key

Practical and Economical

SUPERPHOSPHATE PLANTS

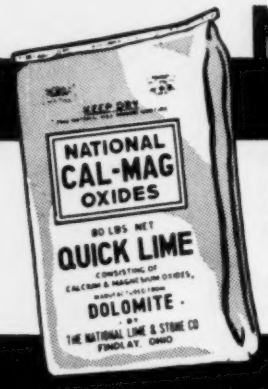
TYLER CHAIN MILLS **ELEVATORS** **ELEVATOR BUCKET CLEANERS**

COMPLETE ENGINEERING SERVICE

Write Us Today About All Your Equipment Requirements

LONGHORN CONSTRUCTION CO.

P. O. BOX 336 **SULPHUR SPRINGS, TEXAS** **TUX 5-3124**



NATIONAL CAL-MAG OXIDES

NOW IN TWO SCREEN SIZES

MgO 40.39 – CaO 58.07 – TNP 203.88

Superior for Dehydrating, Neutralizing, and Curing factors in the preparation of effective fertilizers.

PROMPT SHIPMENTS

Three railroads serve our Carey, Ohio, plant — assuring prompt delivery — everywhere.

WRITE FOR COMPLETE INFORMATION TODAY! Dept. CF

We Also Produce
DOLOMITIC HYDRATED LIME (165 TNP)
and
KILN DRIED RAW DOLOMITE (107 TNP)
Screened to size

The NATIONAL LIME and STONE CO.
General Offices • • • • • FINDLAY, OHIO

ASHCRAFT-WILKINSON CO.

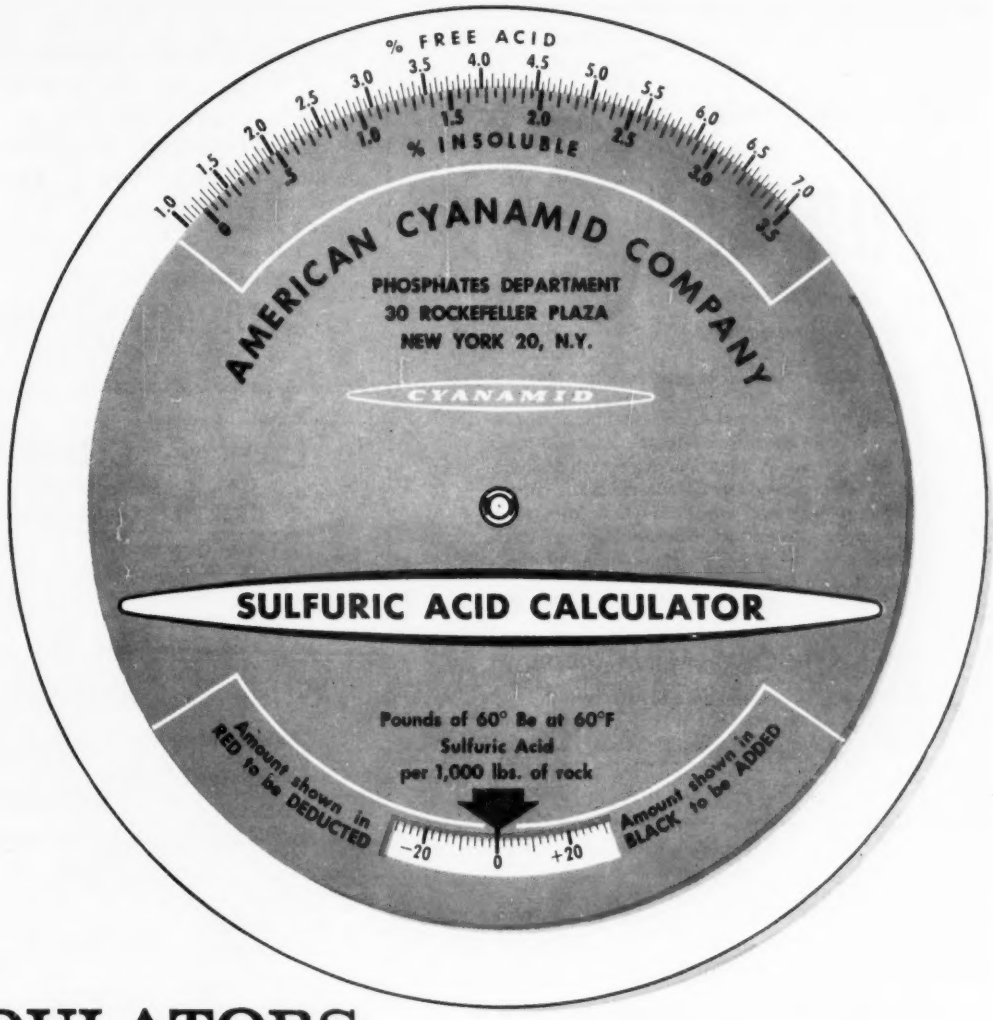
Fertilizer Materials — *Oil Seed Meals*

Home Office: ATLANTA, GA.
Cable Address
ASHCRAFT

Offices: NORFOLK, VA., CHARLESTON, S. C., TAMPA, FLA.
JACKSON, MISS., COLUMBUS, OHIO, MONTGOMERY, ALA.
DES MOINES, IOWA

Exclusive Distributors: DUVAL SULPHUR & POTASH COMPANY
and ESCAMBIA CHEMICAL CORPORATION

AMMONIATES — FEED STUFFS — SULPHUR — POTASH
INDUSTRIAL AND AGRICULTURAL
CHEMICALS



For ACIDULATORS

This sulfuric acid calculator is another of Cyanamid's working services to the phosphate industry. Whether your requirements are high grade phosphate for acidulation or triple superphosphate for ammoniation, Cyanamid serves you from the mine to your plant:

- direct order service to our Brewster, Florida plant
- traffic specialists to help route your shipment to get it to your plant when needed
- technical service at your plant

For free calculator, write American Cyanamid Company, Phosphates Department, 30 Rockefeller Plaza, N. Y. 20, N. Y.

CYANAMID

Producers of:
High grade phosphate rock
TREBO-PHOS Triple Superphosphate

Arrives on Schedule

FUR-AG®

the sterilized organic conditioner

For years ... First Choice of Leading Fertilizer Manufacturers

Fur-Ag is readily available ... inexpensive, produced in volume, shipped to you on schedule 12 months a year. Among Fur-Ag's many advantages: reduces bag set, speeds up curing in the pile, provides bulk, sterilized—free from plant diseases, insects and weed seeds. Fur-Ag's dark, *natural color* helps make a rich-looking product. Write today for Bulletin 127.

The Quaker Oats Company
CHEMICALS DEPARTMENT
345 The Merchandise Mart, Chicago 54, Illinois

Specialists in

MAGNESIA FOR AGRICULTURE

EMJEO (80/82% Magnesium Sulphate)
Calcined Brucite (fertilizer grade) 65% MgO

POTNIT
(95% Nitrate of Potash) for Special Mixtures and Soluble Fertilizers
Other Fertilizer Materials

Insecticides
Fungicides

EXPORT
•
IMPORT

Berkshire Chemicals
INC.
420 LEXINGTON AVENUE, NEW YORK 17, N. Y.
BOSTON • CHICAGO • CLEVELAND • PHILADELPHIA • SAN FRANCISCO

Cut Production Costs–

Speed up your plant with
ATLANTA UTILITY FERTILIZER MACHINERY

Fertilizer Mixing Systems	Elevators
Revolving Screens	Fertilizer Shakers
Mixing Plows	Cage Mills
Clod Breakers	Batch Mixers

Write Today for Descriptive Folder

ATLANTA UTILITY WORKS
EAST POINT, GA.

LAW & COMPANY
Founded 1903
FERTILIZER CHEMISTS
Three Convenient Laboratories

P. O. Box 1558	P. O. Box 789	P. O. Box 629
Atlanta 1, Ga.	Montgomery, Ala.	Wilmington, N. C.

Wiley & Company, Inc.
Analytical and Consulting Chemists
Calvert & Read Streets
BALTIMORE 2, MD.

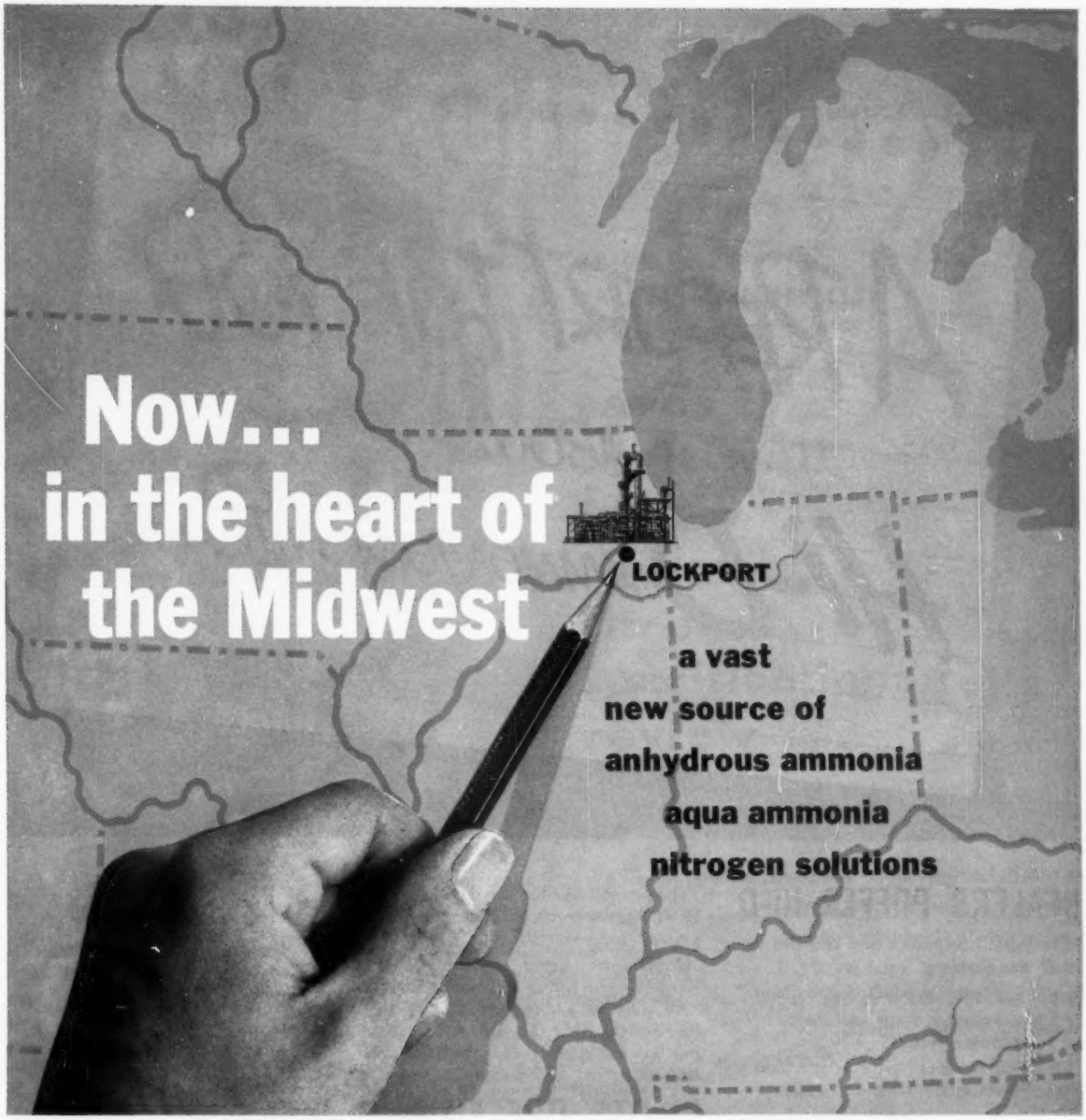
Alex. M. McIver & Son
BROKERS

Specializing
SULPHURIC ACID
SULPHUR
GROUND COTTON BUR ASH, 38/42% K_2O Potash
HYNITE TANKAGE
CASTOR POMACE
TUNG POMACE
ORGANIC AMMONIATES
AMMONIATED BASE AND SUPERPHOSPHATE
SULPHATE OF AMMONIA
(Kiln Dried 21% N)

Representatives
Morgan Brothers Bag Company, Inc.
BAGS—PAPER AND TEXTILE

DOLOMITIC LIME
(42-44% Magnesium Carbonate)
(54-56% Calcium Carbonate)

PEOPLES OFFICE BUILDING
Charleston South Carolina
Phones: RA 3-4828 & RA 3-4829



Texaco's new Lockport plant is centered among all major rail, water and truck routes—a reliable source of ammonia and nitrogen solutions.

TEXACO LOCKPORT (ILL.) AMMONIA PLANT NOW MAKING DELIVERIES

Orders for anhydrous and aqua ammonia, and nitrogen in a variety of solutions are mounting. The advantages of doing business with Texaco Lockport are compelling:

Texaco closeness: The new ammonia plant is located right in the heart of the farm belt. Shipping distances are shorter, formulators get faster and better service.

Texaco uniformity: The Lockport plant is new from top to bottom—new processing equipment to assure product uniformity; new handling equipment; and a brand-new transport fleet to speed deliveries and protect purity in transit.

Texaco service: Texaco is famous for its service. The Texaco man will see that your orders are handled according to instructions and that deliveries are scheduled to tie in with your operations.

For fast reliable petrochemical service, call or write The Texas Company, *Petrochemical Sales Division*, 332 South Michigan Avenue, Chicago 4, Illinois, or 135 East 42nd Street, New York 17, N. Y.

TEXACO
PETROCHEMICALS

A REPORT FOR YOU ABOUT Hi-D® AMMONIUM NITRATE

DEALERS PREFER Hi-D

"The rapid acceptance and demand for Hi-D was amazing."

"Hi-D is a better product in good bags."

"Arrived in better shape and stored better for a longer period."

"First time farmers have ever specified a brand of ammonium nitrate."

"Hi-D bags stand out well in warehouse. Farmer notices them as soon as he walks in."

"We've had really good reports about the product from our Hi-D customers."

"When farmers asked for ammonium nitrate, we sent them Hi-D. We were surprised at the number who insisted on Hi-D when they re-ordered."

"The spring advertising campaign sure built farmer recognition for Hi-D."

FARMERS PREFER Hi-D

"Really prefer the Hi-D granules in our field machinery over other kinds of ammonium nitrate."

"The men all like the way Hi-D handles. Hi-D throws nicely. What we don't use at once stores very well."

"Best moisture-proof bag I've ever seen. Used Hi-D on coastal Bermuda grass and corn, plus oats and rye in winter. A really free-flowing material, you never get too much or too little. Hi-D is always in good condition even after storing."

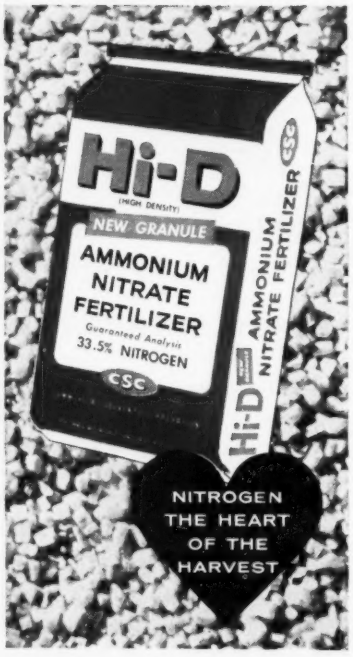
PILOTS PREFER Hi-D

"Hi-D arrives dry and stays dry. Flows evenly from start to finish. Plane hopper holds up to 25% more material. Saves me air time."

"More pounds of Hi-D in the hopper saves air time. Really flows nice. Fly at 30 feet with prills, 36 feet with Hi-D which means fewer times through a field, more profit per job."

"Hi-D is always dry when we open it. Flows regularly from start to finish – no bridging in the hopper. Shuts off fast. No bind due to dust."

IT'S EASY TO SEE THAT
IT'S EASIER TO SELL Hi-D!



A PRODUCT OF **COMMERCIAL SOLVENTS CORPORATION** 1817 WEST FULLERTON AVENUE, CHICAGO 14, ILL.
STERLINGTON, LA. • 344 WILLIAMS ST., N.W., ATLANTA, GA. • 7890 FOLK AVE., ST. LOUIS, MO. • TERRE HAUTE, IND.

THE MAN WITH THE ★ MULTIWALL PLAN

UNION PACKAGING SPECIALIST DON DEININGER

saves Multiwall user $8 per M through specifications review

A Chemical Company, already using 43 different sizes and types of Multiwalls, planned to add new products to its line. Union Packaging Specialist Don Deininger recommended a simplification of Multiwall specifications and inventory. Union prepared a Specifications Manual for the manufacturer, also simplified, unified and modernized his bag designs.

Union Multiwall Recommendations are based on this 5-point Packaging Efficiency Plan

- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

Results: user reported: (1) Union's recommendations for re-designing bag sizes and constructions in some instances saved as much as $8 per M. (2) The new Specifications book enabled the customer to order bags more easily and accurately. It also simplified his inventory control. (3) The new designs established a visual relationship between his family of products, enabled his sales force to do a better merchandising job.

This is a typical example of Union's 5-Point Multiwall Plan in action. Perhaps it can produce gains in your own Multiwall packaging operation. Write for additional information.

Better Multiwall performance through better planning

union camp

UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

UNION MULTIWALL BAGS

UNION BAG-CAMP PAPER CORPORATION

233 BROADWAY, NEW YORK 7, N. Y.

D. F. Wicks
New York, N.Y.

W. E. Noble
New York, N.Y.

H. L. Houser
Buffalo, N.Y.

T. C. Splane
New York, N.Y.

R. L. Walters
New York, N.Y.

S. G. Shetter
Middletown, Ohio

J. J. Greene
Louisville, Ky.

M. F. Keane
Cleveland, Ohio

A. P. Wolff
Detroit, Mich.

R. W. Drury
Kansas City, Mo.

R. J. Stevens
Chicago, Ill.

R. G. Roberts
Chicago, Ill.

W. R. Raleigh
Chicago, Ill.

R. T. Brown
St. Louis, Mo.

T. B. Athey
Baltimore, Md.

Get acquainted with a Packaging Problem-Solver...

Raymond

THE MULTIWALL MAN

...and the Multiwall Men at your service

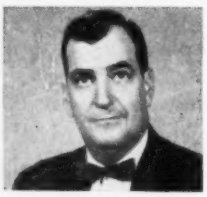
And . . . as our little man suggests, the Raymond representatives pictured here are practical packaging problem-solvers. Years of experience in the multiwall field backed by the Kraft paper resources of Albemarle and the extensive manufacturing facilities of Raymond, gives you the answer to your problems . . . rapidly and effectively. Raymond men are bag men. They know their product and how to make it work for you. They see to it that the last bag of your order is as crisp and salesworthy as the first. Phone the Raymond Multiwall man nearest you . . . let him show you how you can solve your packaging problem with a Raymond Multiwall!

RAYMOND BAG CORPORATION

Division of Albemarle Paper Mfg. Co.

MIDDLETOWN, OHIO • RICHMOND, VIRGINIA

P. M. Seaman
Philadelphia, Pa.



C. L. Stemen
Charlotte, N.C.

H. L. Gulden
Minneapolis, Minn.

Frank Finegan
Kansas City, Mo.

Dave Flook
Denver, Colo.

C. A. Dillon
Houston, Texas

Arcadian® News

Volume 3 | For Manufacturers of Mixed Fertilizers | Number 1

EFFICIENT OPERATION PAYS IN MIXING GRANULAR GOODS

Methods for Safeguarding Profits and Plant Safety

Careful cost accounting is a money-saving practice in any business. By the same token, it will pay you to keep a constant and efficient check on the methods and materials you utilize in manufacturing granular fertilizers and high-analysis mixed goods. Such a practice not only saves money, it also serves as a safeguard in maintaining a good safety record in the mixing operation.

Avoid Waste to Save Money

Maintaining top efficiency in the mixing operation for making high-analysis fertilizers keeps costs down by avoiding waste of acid and nitrogen. At the same time it greatly reduces danger of fires, hot spots and other hazards.

Even without acid, a big tonnage of high-analysis fertilizer is being manufactured by using the correct nitrogen solution to get a high ammoniation rate for superphosphate through proper mixing. Addition of sulphuric or other acid is often required to obtain desired fertilizer condition. The acid neutralizes ammonia and holds more nitrogen for high analysis. It also produces the high temperature and low water content required for proper granulation.

With the use of acid, any inefficiency in mixing immediately becomes expensive and hazardous. Either with a batch mixer or a continuous ammoniator, skillful operation is needed to do a good, low-cost job of mixing acid, solutions and dry materials. The spray pipes for acid, solutions, and water if needed, should be separate and in good condition. The rotating flights in the mixer must be kept clean. And the timing of the entry of all materials must be correct. Such a mixing operation can produce fertilizer with very little waste of acid or nitrogen, and with hardly any fumes and no hot spots.

Inspect Spray Pipes Daily

Perhaps the biggest drawback in otherwise excellent equipment is the difficulty involved in changing spray pipes. Careful checking and replacement of the spray pipe that introduces nitrogen solution into the mixer always pays well. Even more careful checking is needed for the spray pipe that introduces acid into the mixer. Daily inspection is best. Some acid pipes have been known to last only 3 or 4 days before losing their good acid distribution pattern. When the meters show an excessive use of acid, the spray pipes should always be examined.

The most modern continuous ammoniator is no guarantee of low acid and nitrogen costs if it is not skillfully operated. Likewise, an old batch mixer, if carefully operated, can do a good job of producing high-analysis goods.

Ask Nitrogen Division

To keep costs down, and to prevent hot spots or fires in the mixer, the main essentials are good operating skill, spray pipes with a good distribution pattern, and proper amounts of acid and the right ammoniating solution. In some mixing operations, skillful handling of the right high-ammonia solution can produce good quality and condition without using acid.

With the wide variety of equipment, plant food ratios, and analyses in common use today, many different ammoniating solutions are required for efficient and economical mixing. Nitrogen Division has the broadest line of nitrogen solutions and experienced technical people to help you get the best results possible with your equpiment and production program. Ask the Nitrogen Division technical service man to help you pick the right solutions for your operation. His services are available to customers at no cost. For prompt technical help, write Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y. Telephone: Hanover 2-7300.

Arcadian News for Fertilizer Manufacturers . . . . . from NITROGEN DIVISION

Boom in Irrigation Opens a Big Fertilizer Market

TONNAGE OPPORTUNITIES

Severe drouths of the past several years have made farmers everywhere take to watering crops. And there's no better place for a fertilizer salesman than a new irrigation area. With the biggest yield-limiting factor, shortage of water, taken care of, the next big limiting factor shows up strong. That is lack of enough fertilizer. Put water and fertilizer together and yields shoot up.

Water alone doesn't make a succession of big crops. The situation with water and fertilizer is like the old riddle about the hen and the egg. It is not really important which came first, but it is mighty important that you have both.

Too many farmers waste irrigation water by not feeding their crops enough fertilizer to take advantage of the new water supply. The first year a farmer irrigates, he may get a big increase in crop yields due to the plant food reserves in the soil. Then his yield drops off, unless he goes to see his fertilizer dealer, or his dealer comes to see him.

In Nebraska, for example, many corn growers are getting only 60- and 70-bushel yields with irrigation. Yet these same fields with enough fertilizer are producing 125-bushel yields with plenty of water. The 1956 winner in the state corn contest produced 208 bushels of corn per acre by using enough water and plant food.

One Iowa farmer lost his unfertilized 1952 corn crop because of drouth. In dry 1953, 4 inches of sprinkler irrigation gave him 65-bushel corn, while his dryland corn produced 30 to 35 bushels. Then, in 1954, sure of a water supply from the nearby river, he used 8 inches of water plus fertilizer. One corner of the field that was missed by the sprinkler didn't produce an ear. But the rest of the field averaged 90 bushels per acre. Even in years of normal rainfall, he had never before gotten more than 70 bushels of corn per acre.

The story of teamwork between fertilizer and water is the same everywhere. In Alabama, irrigation alone failed to improve the yield of Dallis grass pasture. But 600 pounds of fertilizer per acre, plus irrigation, increased the yield 3 tons per acre dry weight. Unirrigated cotton yielded only 1,900 pounds of seed cotton per acre. Water and 240 pounds of nitrogen increased the yield to 5,000 pounds of seed cotton per acre.

Irrigated plots, with and without fertilizer, are excellent sales builders for fertilizer, the sure way to show that crops need more fertilizer when they get more water. By picking a soil that is not loaded with plant food at the start, you can dramatize the need for fertilizer.

Balance is Important

Balance between water and fertilizer is just as important as balance between nitrogen, phosphorus and potash. Many farmers learn this only by seeing disappointing yields from their first or second try at irrigation. Whether the water comes from irrigation or from extra good rains or deep soil moisture, the result is the same. No crop can produce much extra growth from water if it lacks soil fertility. This is shown by Missouri corn fertilization tests in a year with only 5 inches of rain during the growing season. Deep subsoil moisture was good. Unfertilized corn produced only 18 bushels per acre and extracted moisture from a 2-foot depth of soil. This crop used 21,000 gallons of water per bushel harvested. Corn with adequate fertilizer drew moisture from a 5-foot depth of soil and produced 79 bushels per acre. With enough plant food to make use of moisture, this corn used only 5,600 gallons of water per bushel.

Likewise, 3 years of tests in New York State showed that "high-fertilization" hay and pasture consistently outyielded irrigated plots with "normal-fertilization." A 5-year Illinois test of pasture irrigation without fertilizer showed that the small increase in beef production did not pay for the irrigation.

Irrigation is on the increase everywhere that farmers can build ponds, dig wells or pump from streams. For high-value, intensive crops that are always highly fertilized, irrigation almost always pays well, even in short dry spells. For field crops and pastures, water provides profits in proportion to the fertilizer used.

How big is the irrigation market? In the West, where irrigation first grew big, there has been about a 10% increase in watered acreage since 1954. Water supplies have been the biggest limiting factor. Nebraska alone has 2 million irrigated acres today.

In the humid East, irrigation was so unimportant until recently that no census data were kept for the 28 Eastern states. But the long-time weather records show that even in most of this area, which has 30 inches or more rainfall in normal years, drouth periods are long enough most years to make supplemental irrigation produce profitable yield increases. Farmers are finding this out. In 1939, the 28 Eastern states had about 39,000 irrigated acres. By 1954, this had increased to 546,000 acres. The latest figures show 650,000 acres are irrigated in the East. Everywhere that water is put to work in irrigation, it is building new fertilizer markets. It will pay you to follow the water to the fields!

Arcadian News for Fertilizer Manufacturers . . . . . from NITROGEN DIVISION

Promote Better Pastures to Sell More Fertilizer

Pastures and meadows are the stepchildren in the farm crop family, when it comes to fertilizer use. Our starved and sod-bound grasslands should be a big market for fertilizer. We have 984 million acres of hay and pasture land, compared to 335 million acres in tilled crops. How do we spread the word that it pays to spread fertilizer on grass?

When a farmer fertilizes corn or wheat, he sees the results in more bushels at harvest. When he tries a little fertilizer on pasture, the results are hard to see. Cows graze away the evidence. And he cannot easily measure the extra milk or meat produced.

Grass is a lot of different crops that require different kinds of management. Orchard grass has to be handled differently than blue-grass or timothy. Reed canary grass is nothing like fescue or wheat-grass. Coastal Bermuda grass is quite another thing than common Bermuda grass. Farmers say grass crowds out legumes, but legumes sometimes appear to crowd out brome grass. The wrong timing of grazing and harvesting often diminishes the benefits that fertilizer provides.

How is it then, that some farmers use 500, 1000 pounds or more fertilizer per acre to make grasslands pay well? Several basic principles help them make money on grass. They use new seeding methods to establish good stands. They use deep-rooted grassland crops that make good use of more fertilizer. They manage their grasslands for a longer producing season. They aim to have animals per acre instead of acres per animal. On arid rangeland, this won't work. But anywhere grass gets enough water to produce one ton of feed per acre under ordinary management, fertilizer can produce extra tons of profit-building feed. The fertilizer dealer can profit by dramatizing the large yields produced with plenty of fertilizer.

It is important, when grass is liberally fertilized, to cut or feed it while young. There is greater feed value in young grass—more protein, more vitamins, more palatability. And the next cutting comes along sooner. A 1,000-pound dairy cow will eat 105 pounds of lush pasture per day, while she will eat only 80 pounds of average fertilized pasture or 60 pounds of poor pasture. A cow will eat 2½ pounds of young-cut hay for every 1½ pounds of poor, late-cut hay she will chew down.

Continuous Grazing

Good farmers grow several different pasture crops to get a sequence of grazing over the growing season. Top-dressing with fertilizer several times a year also helps produce a long pasture season.

Where legumes do not thrive, grass can make big yields of feed rich in protein. Fall application of mixed fertilizer plus heavy nitrogen top-dressing in late spring makes amazingly big hay crops. And the crude protein content of such hay may go up to 16 or 20%. One New Jersey test produced one ton of protein per acre in grass hay. The late spring application of high-nitrogen fertilizer, just a few weeks before harvest, moves directly into building high protein content in the first cutting of hay. Such a program has produced 4 tons of 20% protein hay per acre.

New varieties of deeper-rooted grasses are capable of using high rates of fertilizer to push out really big yields of low-cost forage. In the South, for example, Coastal Bermuda grass is producing 10 to 12 tons of dry-weight forage per acre. Florida results with Bahia and Pangola grass show 20 extra pounds of dry forage produced for every extra pound of nitrogen in fertilizer.

Georgia and Texas report 700 pounds of beef per acre of high-yielding, well-fertilized grass.

Farther north, fescues, orchard grass, brome, Reed canary grass and other vigorous varieties are well able to use large amounts of fertilizer to produce big yields of forage. Farmers often complain about sod-bound grass that produces little feed. Small amounts of fertilizer make little improvement. But heavy applications of fertilizer make yields jump.

In North Dakota and Minnesota, for example, sod-bound brome and crested wheat grass were producing only one ton of hay per acre. Fertilizer application, including 30 pounds of nitrogen, boosted yields to 2½ and 3½ tons per acre. In Missouri, rough, hilly, erosion-prone land seeded to fertilized grass and legumes is producing as much feed as good bottom land.

How do you measure hay and pasture profits from fertilizer? Bales of hay per acre are easy to measure. Pasture cow days per acre, beef and milk gains per week, extra days or weeks of grazing take effort to measure. They are seen best by the farmer who likes to keep records. And there are reams of records of pasture profits made with fertilizer.

It will pay you to obtain all available information applicable to your sales territory and use it to aggressively spread the word that proper management and plenty of fertilizer make pastures highly profitable. Pastures are a big tonnage opportunity for fertilizers.

HERE'S THE BIG LINE OF Arcadian® NITROGEN SOLUTIONS

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get technical assistance and formulation advice from the largest and most efficient staff of nitrogen experts. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	26
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.188	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.052	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
10	44.4	24.5	56.0	10.0	9.5	11.0	1.108	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.081	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.925	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.972	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	—

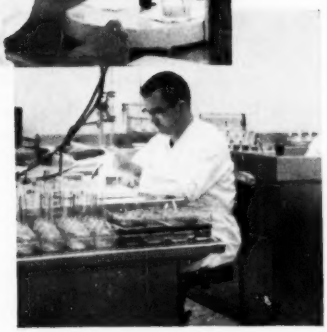
Other ARCADIAN® Nitrogen Products: UREA 45 • A-N-L® Nitrogen Fertilizer Ammonium Nitrate • American Nitrate of Soda • Sulphate of Ammonia

NITROGEN DIVISION Allied Chemical & Dye Corporation

MAIN OFFICE: 40 RECTOR STREET, NEW YORK 6, N. Y., PHONE HANOVER 2-7300

Hopewell, Va., P. O. Drawer 131.....Cedar 9-6301
Ironton, Ohio, P. O. Box 98.....Ironton 8-4366
Omaha 7, Neb., P. O. Box 166.....Bellevue 1464
Raleigh, N. C., 16 W. Martin St.....Temple 3-2801
Columbia 1, S. C., 1203 Gervais St.....Columbia 3-6676
Atlanta 3, Ga., 127 Peachtree St., N. E. Jackson 2-7805
Memphis 9, Tenn., 1929-B South 3rd St. Whitehall 8-2692
Columbia, Mo., P. O. Box 188.....Gibson 2-4040
Indianapolis 20, Ind., 6060 College Ave. Clifford 5-5443
Kalamazoo, Mich., P. O. Box 869.....Kalamazoo 5-8676
St. Paul 4, Minn., 45 N. Snelling Ave.....Midway 5-2864
San Francisco 4, Cal., 235 Montgomery St. Yukon 2-6840

57 sample tests per hour is our way of proving GRADE UNIFORMITY



International Quality-Controlled

PHOSPHATE ROCK

For acidulation.

For industrial chemicals.

For direct application to the soil.
(Ground Rock)

468 sample tests are made every eight hours. Not surprising . . . because *International Phosphate Rock* is sampled and tested at every stage of production—recovery, blending, drying, grinding, loading. No wonder it is so highly regarded for its grade uniformity and quality. You always get fast, dependable deliveries of the grade you need, in the tonnages you want. This complete service makes it good business to depend on *International* for *Quality-Controlled Phosphate Rock.*

INTERNATIONAL MINERALS MINERALS *International* CHEMICALS **& CHEMICAL CORPORATION**

PHOSPHATE MINERALS DIVISION..... .....20 N. WACKER DRIVE, CHICAGO 6

PHOSPHATE MINES AND PLANTS IN FLORIDA AT NORALYN, PEACE VALLEY, ACHAN, MULBERRY; IN TENNESSEE AT MT. PLEASANT, WALES AND GODWIN

If you can't sell the products you make you are out of business. This simple fact puts it squarely up to your selling operation. This January 1958, what will it be—sell, or sink? Sometimes another look, or a fresh viewpoint, can spark a new, a better, a different sales program for you. Read and see. . . .

You Can't Eat It-So Sell It

Remember The Good Old Days

There was a time when fertilizer was not running out of our ears. It was a time when things went along merrily, with a minimum of throat cutting. It was a time of low analysis goods and low pressure selling.

Somewhere in between we seem to have forgotten something. We have learned to upgrade our active plant food. The farmer has learned to accept goods he formerly looked on with the holy horror of the true reactionary. We have built fine big plants that can serve whole groups of states . . . to replace those that were just neighborhood operations.

And perhaps that is where we have forgotten something. We have ceased to be the close and friendly good neighbors of the farmer. In the rush to conquer new fields, we have lost the trick of being buddies with our customers. We leave it to salesmen, who leave it to dealers, who leave it to clerks. And the farmer goes his own way until he feels a need for help. Then he turns to the County Agent.

The County Agent is a gent who knows farming. He doesn't call himself an agronomist — he's just a friend who knows farming and has good ideas about it. He is the good friend who chooses a sturdy straw, and likes to hang over the fence and chat about how to make the soil do better.

If it were not for the County Agent, and the work of the agronomists in the Land Grant Colleges, we probably would have twice as much fertilizer running out of our ears as we do now . . . and the goods sold would be far lower in active plant food content than they average now.

Grass Roots

The politicians have a phrase about getting back to the grass roots. We should ponder this phrase, because it means something literal to us. We who manage fertilizer concerns are pavement people too much of the time. We mix up stuff and set it out on the loading platform, and somehow some of it gets carted away.

Management in the fertilizer field had better get off the sidewalk, and out into the fields—and see what manner of man is out there applying somebody's plant food to his soil. They might take a look at what the soil really needs, and see if the right grades are in use.

If you try it, you'll be surprised —unless you are one of the small operators who still remembers the good old days.

The Vicious Cycle

There is a belief, unfortunately founded on experience, that the worse things get, the less fertilizer will be used. This belief was well-established long before the government began messing in the economics of agriculture.

But there is a valid opposite side to the coin—the worse things get the less fertilizer is used the worse things get. A vicious cycle.

Like most economic cycles, this one is man-made. It is not an act of God. It doesn't just happen. It is created. And it is created because the industry which suffers from it, along with the farmer and the public that needs his products, does nothing much about it.

We sit in our gilded towers in New York or Chicago, and decide that crop prices will be down. So we cut production of fertilizers. And we pull in our salesmen early. No use in paying out good money for travel expenses, by golly! Not this year.

But there are ways and means.

The Little Feller

Let's consider the small fertilizer plant . . . say 5,000 or 10,000 annual ton capacity. It serves a county or two or three; anyway, a circle of about 50 miles diameter. A 25-mile haul is nothing these days of good farm-to-market roads.

In that area are mostly small farmers, but they all have their own trucks and tractors. The mule-power farm is almost a thing of the past.

The farmers come in and chin awhile with the head man. He is in no ivory tower. He knows the soil out there, and the markets for what it will grow. He may not be a top-flight economist, but his market guesses have been pretty good through the years. He may not be any kind of an agronomist, but his advice seems to work.

So his contacts are more than social.

But they are social. He knows these people and they know him. They meet all through the year. He belongs to the community, and his personal reputation is sewed into every bag of mixed goods his boys load onto those trucks.

Such plants occasionally go broke, but not very often. And such plants roll pretty well with the punches as economic conditions come and go. They may not rate gold Cadillacs, but these neighborly, neighborhood

operators do pretty well for themselves.

More important, they do mighty well for their customers with the sound advice they give out. Alongside the County Agent and the Land Grant agronomists, the best friend the farmer has is his local fertilizer plant.

This is fundamentally wrong. It's like playing the stock market on your own as opposed to buying into a well-managed investment trust portfolio. The little feller plays it from the seat of his pants. The big boys can hire the best economist-agronomist teams in the world. And they do.

But if the findings of those teams get lost between the ivory tower and the farm — what good are they?

And that's the story of why we have fertilizer running out of our ears.

There is so much fine information locked up in hallowed halls that is needed down on the farm.

Lost Molasses

There's an awful lot of molasses gets lost pouring it from one jug to another. The research done in the USDA, the Land Grant schools, by the agronomists on the industry's payroll, by the associations. But where does it go?

Take, for example, the fine job done jointly by the Land Grant Colleges and the National Plant Food Institute on the subject of the economic results of following the Land Grant recommendations. This team operation has been done for most of our agricultural areas, charted and ably presented by Institute people to various assemblages, such as local-level Educational Associations.

But where has it gone from there? The boys may have made some notes. They may have carried the facts back home in their memories. They may have told it to their salesmen or fellow-salesmen. But have the ripples stopped there — or have they gone on to the edge of the pool.

Ripples In The Pool

A piece of information dropped into a pool can either sink—or it can spread out in ever-widening ripples until it reaches to every shore. If it sinks, it was a waste to develop the information. And it looks from where we sit as though a great deal of fine and expensive knowledge is drowned in the bottom of the pool.

What can our salesmanagers do about it? We work with salesmen who are pretty well set in their ways. In turn they often work with dealers who are mighty set in their methods —and to whom fertilizer may be a minor part of their business.

Along in there the ripples are stopped, and fail to bathe the farmer mind.

Is the system wrong? Is there some way we can afford to be neighbors with the farmer, even though we may operate within the framework of a great national concern? And we say "afford," because with the best will in the world, and the greatest human desire to be a friend to man—it costs money to carry out such a program, and manpower, and training, and careful selection of emissaries.

Yet it needs to be done. The farmer is a conservative character. Even the agricultural college-trained farmer is conservative. He has to be. His whole income for the year is predicated on not making a mistake at planting time. So he cannot be high-pressured.

He can be educated through the farm press, both in the editorial and the advertising pages. He can be exposed to farm-group meetings. He can be preached to locally, via his county weekly, his local radio station—or whatever channels of communication exist.

But somebody, finally and personally, must push the switch that converts him for a low-level fertilizer user to the Land Grant recommended level. And unless this is done, and well done, the process of education is mighty slow.

Can We Afford to Wait?

Our industry has invested many millions in expansion. By 1975 we know we will have 200,000,000 mouths to feed in this country . . . maybe sooner. We have 170,000,000 right now.

We have just so many acres of tillable ground, not occupied by missile plants, or continental highways, or urban areas. There's not a thing we can do about stretching those fields, except to make each acre do a better job.

That's our pitch. It is our basis for selling more fertilizer per acre. But, except for two wars, which more than tripled US fertilizer consumption, and built us up to 22,000,000 plus annual tons of sales, our pitch would have made mighty little progress.

The Government has helped. Ever since Henry Wallace's time a squeezing of acres has taught the farmer to look for ways to get the same crop from less land. And that has sold a lot of fertilizer, just as high labor costs have sold a lot of tractors.

But did we sell it?

And what happens if the acreage restrictions go off, and the farmer is back to normal. Will his fertilizer usage remain at what we now consider normal? Or will he retrograde to the old standards? He's mechanized now, so it won't be much problem to open up those fallow fields, and let them feed themselves for a few years.

Meantime, what's happening to the millions of new mouths to feed? And what's happening to our great new production capacity — doubled since 1940 . . . and then some?

Can we afford a slow process of education, or must we do something to get every needed acre of land on a full plant food schedule, every season. That is our need. We must do something about it.

It is a job for real salesmanship, backed by management that can see beyond the corner of the mahogany desk.

We have such people in the industry. But are they being given elbow-room enough to do a job?

Elbow Room

There is a need for some basic thinking in our industry. Somebody must forget everything that grandpa taught, and think about what Sonny is going to face when he comes into the control of the business. And what is Sonny going to be like? An old fuddy-duddy, or a bright young lad who knows his agronomy, understands the farmer and—in addition to a well-equipped, efficient plant—has a staff of men out there in the field who know how to be buddies with farmers and how to get the message all the way down the line to where it does some good?

Will he be stuck in a strait-jacket at a desk, or will he be trained to swing his arms to some purpose?

It's something to think about now . . . fast . . . because time is running out for some of us.

It is, actually, a matter of survival. Can we stay in business until the demand catches up with us, or must we build the demand that will put our big, shiny new plants over the threshhold of overhead, and into the fine big area of profitable operation?

There is little doubt of the need. There's plenty of doubt about the answers. And there's even more doubt that, once the answers are found and proven, that they'll go into general practice.

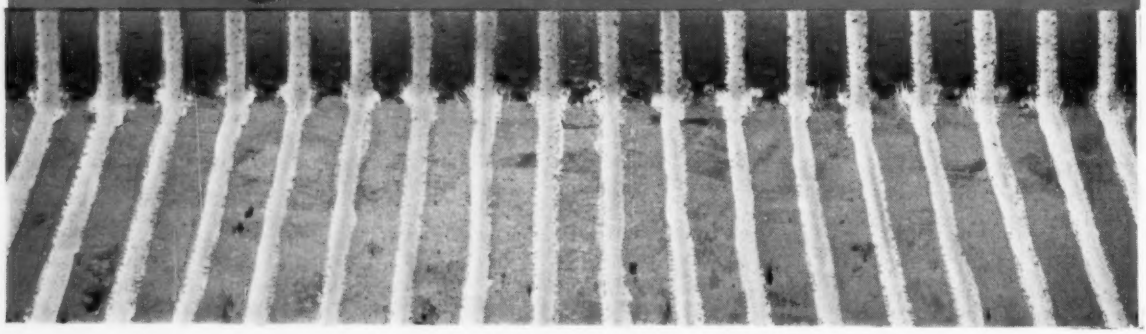
HEALTHY SOIL . . .
HEALTHY PROFITS!

DUVAL

HIGH GRADE MURIATE OF POTASH

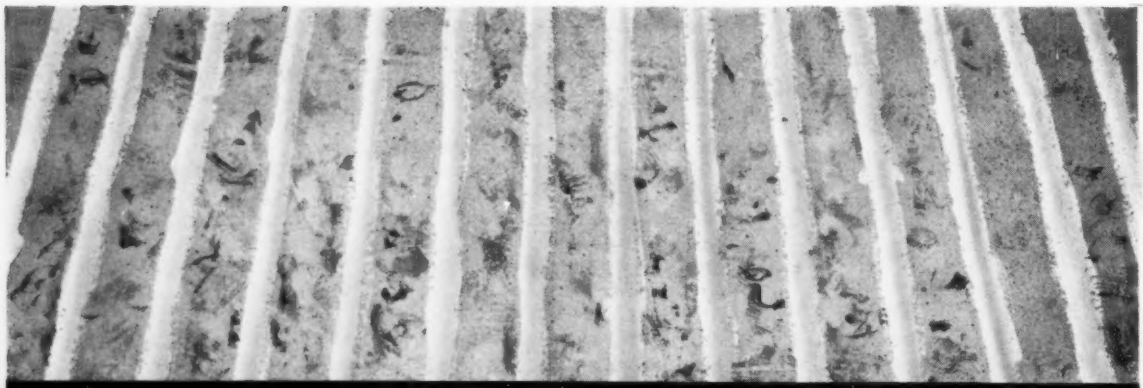
Duval Muriate of Potash—A vital element at low cost for healthy soil and healthy profits.

• HIGH ANALYSIS • DEPENDABLE SUPPLY • UNSURPASSED SERVICE



DUVAL SULPHUR and POTASH COMPANY

MODERN PLANT AND REFINERY AT CARLSBAD, NEW MEXICO



ASHCRAFT-WILKINSON COMPANY

Address communications to:

Exclusive Distributors

Atlanta, Georgia • Cable Address: Ashcraft

NORFOLK, VA. • CHARLESTON, S.C. • TAMPA, FLA. • JACKSON, MISS. • COLUMBUS, OHIO • MONTGOMERY, ALA. • DES MOINES, IOWA

NPFI Names Todd Tremblay To Pacific Northwest Post

F. Todd Tremblay of Seattle, Wash., was named Pacific Northwest representative of the National Plant Food Institute, for the states of Idaho, Montana, Oregon, and Washington, with headquarters in Seattle. The appointment of Mr. Tremblay was made by Dr. Russell Coleman, Executive Vice President of the Institute, effective Dec. 1.

Mr. Tremblay will have specific responsibilities for conducting the Institute's expanded program of research and education in the Pacific Northwest.

For the past five years, Mr. Tremblay has been Manager of the Fertilizer and Farm Chemicals Department of the Washington Co-Operative Farmers Association, during which time he helped initiate the production of field corn on a commercial basis in the irrigated areas of eastern Washington.

For eight years he was a soil scientist with the Western Washington Experiment Station, where he did work in field research on soils and crops with special emphasis on rates, ratios and placement of fertilizer for all major crops in Western Washington. While at the station, he initiated a program of leaf analysis.

AAI Meet In Little Rock

The Agricultural Ammonia Institute's Seventh Annual National Convention and Trade Show December 11-13 at Little Rock took the industry into a new phase of its comparatively short existence. Delegates dispensed with most of the usual convention speeches, turning their major attention to discussions of use, promotion and results and to examination of new equipment displayed in the trade show booths.

Paul J. Duesterhaus, 36-year-old owner of Duesterhaus Farm Supply Company, Quincy, Illinois, was named Institute president.

New directors are David H. Bradford, Jr., Mid-South Chemical Corp., Memphis; Carl Bauserman, South Michigan Nitrogen Co., Richland, Mich.; George Dunklin, Planters Fertilizer Co., Pine Bluff, Ark.; Harry Igo, Plainsman Fertilizer Co., Plainview, Texas; A. J. Schlabach, Aldo Soil Service, Wauseon, Ohio; Leland Hopkins, Jackson Tank Co., Jackson, Miss.; Cecil Squibb, Squibb-Taylor, Inc., Dallas; and Don Sanford, Dow Chemical Company, Midland, Mich.

In addition, Hampton Pugh of Tillar, Ark., was named a director to fill an unexpired term.

New officers besides Mr. Duesterhaus are S. C. Smith of the Smith Company, Uvalde, Texas, first vice-president; Raymond C. Singletary, Jr., Blakely Peanut Co., Blakely, Ga., secretary; and Mr. Bradford, treasurer. Those officers and Fred M. Stewart, Agricultural Ammonia Service, Santa Paula, Calif., retiring president; and C. J. Struble of Standard Oil Company of Indiana, Chicago, make up the Executive Committee.

Next year's convention will be in Chicago December 3-5, and the 1959 convention will be held in Dallas.

Clark to Make Dusting Plane

Clark Aircraft, Marshall, Texas, has received final approval from the CAA to manufacture an all-metal bi-plane designed specifically for crop dusting and spraying. They promised to begin manufacture at once.

Standard Chemical Sold At Auction

Standard Chemical Company, Troy, Ala., which produced 20,000 tons of fertilizer annually and employed as many as 300 workers, before it closed last April a victim of the soil bank program, was sold at auction December 11, 1957 to Mr. and Mrs. Louis Head of Troy, two major stockholders in the firm, for $124,750. The plant, one of the oldest and largest southern fertilizer firms, was valued at about $2,500,000. It was forced to close when farmers reduced the purchases of fertilizer as they placed their acreage in the soil bank.

The fertilizer plant was first sold in sections for $110,000 and then was auctioned as a whole for $115,000, plus $9,750 for payloaders and motors.

Billionth Pine Planted in U. S.

The U.S. Forest Service celebrated the planting of the billionth pine seedling December 18. Georgia was chosen as the site of the planting and attendant ceremony because that State leads the nation in pine seedling production. Georgia's Governor was chosen to do the planting, and at the same time dedicate new seedling nurseries at Macon and Reidsville.

Vacuum Cleaner Collects Product

Out in the Sierra Nevada foothill a huge vacuum cleaner device picks up leaves, piled up through the years. They are then ground and the resulting mold product is sold for California flower beds. Ned Waters, entrepreneur of this service, also gathers and sells white fir bark, which is said to be good for orchid propagation.

OBITUARIES

M. Dean Broadfield, 68, of North Little Rock, Ark., died Dec. 23 in an Atlanta hospital while spending the Christmas holidays with his sister, Mrs. Oliver T. Ray. He was general manager of the Arkansas Plant Food Co.

Lee Turner, eastern regional sales manager, Bagpak Division, International Paper Company, died in Baltimore, Maryland, December 24, following an operation.

Preliminary report

Commercial Fertilizers and Primary Plant Nutrients

Consumption in the United States Year ended June 30, 1957

by

WALTER SCHOLL
FLORENCE B. CRAMMATTE
MARION M. DAVIS

Fertilizer Investigations Research Branch
Soil and Water Conservation Research Division
Agricultural Research Service
U. S. Department of Agriculture
Beltsville, Maryland

FERTILIZERS

The tonnage of commercial fertilizers consumed in the United States and Territories (Hawaii and Puerto Rico) during the year ended June 30, 1957, showed a small gain over that used in the preceding year. The total consumption amounted to 22,485,000 tons, an increase of 292,000 tons or 1.3 percent **(Table 1).** Consumption of mixed fertilizers amounted to 14,575,000 tons—a decrease of 201,000 tons (1.4 percent)—and of materials for direct application 7,910,000 tons—an increase of 493,000 tons (6.6 percent). Included in the materials are 6,956,000 tons of products containing one or more of the primary plant nutrients (N, P_2O_5, K_2O), 929,000 tons of secondary and trace nutrient materials, and 25,000 tons not classified. The use of materials containing primary nutrients increased in the amount of 328,000 tons (4.9 percent) and secondary and trace nutrient materials by 139,000 tons (17.6 percent) over their respective use in 1955-56.

Although the national consumption of fertilizers showed an increase in 1956-57, compared with 1955-56, there were decreases in 19 of the 51 tabulated areas. Most of the decrease in total fertilizer consumption was accounted for by 9 of the 13 States comprising the South Atlantic, East South Central, and West South Central regions—while the Pacific and West North Central regions accounted for most of the increase. There was little change in the total tonnage of fertilizer consumed in the East North Central and Middle Atlantic regions — in these, more fertilizer was used in all but 5 of the 12 areas. Most of the States in the New England and Mountain regions, and the Territories, showed relatively large proportional increases in total fertilizer consumption.

MIXTURES

The consumption of mixed fertilizers was found to have increased in all but 23 of the tabulated areas. Most of the decrease occurred in States of the South Atlantic, East South Central, East North Central, and West South Central regions—areas in which the principal increases occurred were the Territories, and the Pacific and West North Central regions, in this order.

The ten grades consumed in largest tonnage in the Continental United States in 1955-56 were also found to be consumed in largest tonnage in 1956-57 **(Table 2).** These ten represent 50 percent of the tonnage of all mixtures consumed in both years. In all regions except the New England, Mountain, and Pacific, their tonnage represents 40 percent or better of the total tonnage of mixtures consumed in the respective regions. The trend in New England is to use grades having a higher proportion of nitrogen while those in the Mountain and Pacific regions generally contain less potash than

Table 2. Regional consumption of the ten principal grades of mixed fertilizers consumed in the Continental United States Year ended June 30, 1957 (Preliminary)

Region	1,000 tons											Percent of
	5-10-10	3-12-12	4-12-12	5-20-20	10-10-10	12-12-12	5-10-5	4-16-16	3-9-9	4-10-7	Total	Regional Total
New England	48	[1]	--	--	43	4	4	--	--	--	99	28
Middle Atlantic	642	30	18	1	161	16	173	1	[1]	--	1,042	60
South Atlantic	504	80	666	1	51	3	134	[1]	510	44	1,993	42
East North Central	109	681	5	562	299	328	12	491	[1]	--	2,488	75
West North Central	1	52	[1]	199	59	209	5	29	--	--	554	46
East South Central	39	49	193	12	40	12	89	7	[1]	320	762	40
West South Central	8	20	[1]	13	4	39	170	--	--	--	254	40
Mountain	[1]	--	--	[1]	2	1	[1]	--	--	--	3	6
Pacific	4	--	--	--	26	[1]	[1]	--	--	--	30	9
Total	1,355	912	882	788	685	612	588	528	511	364	7,225	50

[1] Less than 500 tons.

shown by the average of these ten grades.

MATERIALS

In all but 15 of the tabulated areas the consumption of materials for direct application was higher than in 1955-56. Areas showing decreases were not necessarily the same as those in which mixtures were also found to have decreased. In 9 States, however, there were decreases in both mixtures and materials—five were in the South Atlantic and West South Central regions.

The use of chemical nitrogen materials compared with 1955-56 increased 392,000 tons (12 percent) and potash materials 52,000 tons (13 percent), while the use of phosphate materials and the natural organic materials decreased 108,000 tons (4 percent), and 8,000 tons (2 percent), respectively **(Table 3).**

Of the liquid types of chemical nitrogen materials, the use of nitrogen solutions showed the highest proportional increase (87 percent) from 109,000 tons in 1954-55 and 1955-56 to 204,000 tons in 1956-57. Their use more than doubled in most regions except the Middle Atlantic and Pacific regions—in these their use decreased. Aqua ammonia and anhydrous ammonia use increased 21 and 12 percent, respectively. While the use of aqua ammonia is principally in the Pacific region and the Territories that of anhydrous is in all regions. Consumption was generally 7 to 30 percent higher in all regions except the East North Central and Territories where decreases were noted.

Solid chemical nitrogen products showed greatest consumption changes in ammonium sulfate, urea, and ammonium nitrate—these were increases of 25, 16, and 15 percent, respectively—while sodium nitrate use decreased 11 percent.

The principal change in the use of natural organic materials was a decrease of 22,000 tons (16 percent) in the total consumption of sewage sludges.

The use of the principal kinds of phosphate materials, in general, showed decreases, except for the ammonium phosphates (11-48, 11-50, 13-39, 16-20, 20-52, 21-53, 27-14) which increased from 362,153 tons in 1955-56 to 387,000 tons in 1956-57 (7 percent). The largest decrease was in the total of phosphate rock and colloidal phosphate — from 930,914 tons to 829,000 tons (11 percent)—while superphosphates, 22% and under, and superphosphates,

Table 1. Consumption of fertilizers, by States and Territories, Year ended June 30, 1957 (Preliminary) [1]

STATE & REGION	Mixtures 1,000 tons	Materials[2] 1,000 tons	Total 1,000 tons	Change from 1955-56[3] Percent
Maine	160	8	168	— 8
New Hampshire	16	4	20	21
Vermont	38	17	55	10
Massachusetts	69	18	87	17
Rhode Island	15	2	17	13
Connecticut	63	21	84	10
NEW ENGLAND	361	70	431	4
New York	503	82	585	2
New Jersey	253	24	277	6
Pennsylvania	565	61	626	— 4
Delaware	83	5	88	2
District of Columbia	2	1	3	— 1
Maryland	269	18	287	2
West Virginia	72	10	82	— 3
MIDDLE ATLANTIC	1,747	201	1,948	[4]
Virginia	668	102	770	— 1
North Carolina	1,141	316	1,457	—14
South Carolina	566	252	818	— 5
Georgia	1,051	222	1,273	— 1
Florida	1,315	161	1,476	10
SOUTH ATLANTIC	4,741	1,053	5,794	— 3
Ohio	950	82	1,032	— 2
Indiana	877	210	1,087	2
Illinois	505	850	1,355	— [4]
Michigan	576	58	634	1
Wisconsin	389	37	426	3
EAST NORTH CENTRAL	3,297	1,237	4,534	[4]
Minnesota	325	91	416	13
Iowa	304	158	462	3
Missouri	442	360	802	— 1
North Dakota	27	66	93	34
South Dakota	9	13	22	—16
Nebraska	23	145	168	26
Kansas	76	127	203	— 2
WEST NORTH CENTRAL	1,206	960	2,166	5
Kentucky	442	100	542	1
Tennessee	400	136	536	4
Alabama	750	283	1,033	— 6
Mississippi	301	443	744	— 1
EAST SOUTH CENTRAL	1,893	962	2,855	— 2
Arkansas	140	186	326	—10
Louisiana	157	138	295	— 3
Oklahoma	61	46	107	—21
Texas	274	321	595	5
WEST SOUTH CENTRAL	632	691	1,323	— 3
Montana	4	26	30	— 8
Idaho	7	77	84	29
Wyoming	1	10	11	3
Colorado	13	47	60	8
New Mexico	1	36	37	28
Arizona	26	146	172	13
Utah	3	23	26	—15
Nevada	1	6	7	30
MOUNTAIN	56	371	427	12
Washington	37	147	184	7
Oregon	29	189	218	31
California	282	1,846[5]	2,128	6
PACIFIC	348	2,182	2,530	9
CONTINENTAL U. S.	14,281	7,727	22,008	[4]
Hawaii	66	123	189	14
Puerto Rico	228	60	288	24
TERRITORIES	294	183	477	20
TOTAL: 1956-57	14,575	7,910[6]	22,485	1
1955-56	14,776	7,417[6]	22,193	0
1954-55	15,348	7,378[6]	22,726	2

[1] Includes fertilizers distributed by Government agencies.
[2] Includes: ground phosphate rock and colloidal phosphate, basic slag, secondary and trace nutrient materials, as borax, metallic salts, sulfur, gypsum, etc. used as separate materials. Does not include liming materials or the quantity of materials used for manufacture of commercial mixtures.
[3] Based on fertilizers which are guaranteed to contain one or more of the primary plant nutrients (N, P_2O_5, K_2O) for direct comparison with percent change in nutrient consumption (Table 4).
[4] Less than 0.5 percent.
[5] Includes an estimated 250,000 tons of dried manures.
[6] Materials included not guaranteed to contain N, P_2O_5, or K_2O totaled 929,000 tons in 1956-57, 789,605 tons in 1955-56, and 791,606 tons in 1954-55.

MURIATE
OF POTASH
for the
PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash
Corporation

61 BROADWAY * NEW YORK 6, N. Y.

over 22%, decreased 7 and 14 percent, respectively.

The change in consumption of the potash materials was principally the result of a greater use of potassium chloride which increased from 322,411 tons to 373,000 tons (16 percent).

PRIMARY PLANT NUTRIENTS

The total quantity of primary plant nutrients (N, available P_2O_5, K_2O) estimated in all fertilizers consumed in the United States and Territories was 6,303,000 tons **(Table 4).** This was 248,000 tons (4.1 percent) more than in 1955-56. The total for 1956-57 comprised 2,125,000 tons of nitrogen, 2,243,000 tons of available P_2O_5, and 1,935,000 tons of K_2O. These quantities represent increases of 192,000 tons (9.9 percent) for nitrogen and 60,000 tons (3.2 percent) for K_2O and a decrease of 4,000 tons (0.2 percent) for available P_2O_5 from the respective consumptions in 1955-56. Although the total of fertilizers bearing primary plant nutrients in 1956-57 was but 21,531,000 tons — 1,004,000 tons below the peak year of record (1952-53)—the total nutrient content of this lower tonnage of fertilizers contained 657,000 tons more plant nutrients than the larger tonnage in 1952-53.

In contrast to the change in consumption of fertilizers bearing plant nutrients in 1956-57 compared with 1955-56, **(Table 1)** the total consumption of nutrients increased 2 to 18 percent in all regions and the Territories, except the South Atlantic. The three percent decrease in the South Atlantic region is the same as the percentage decrease in use of fertilizers in this region.

The total consumption of primary plant nutrients supplied by mixed fertilizers is estimated to have been 4,296,000 tons, comprising 841,000 tons of nitrogen, 1,772,000 tons of available P_2O_5, and 1,683,000 tons of K_2O. These quantities represent 44,000 tons (5.5 percent) more nitrogen, 28,000 tons (1.7 percent) more K_2O, and 13,000 tons (0.7 percent) less available P_2O_5 than was used in 1955-56. Materials used for direct application supplied 1,284,000 tons of nitrogen, 471,000 tons of available P_2O_5, and 252,000 tons of K_2O, representing increases of 148,000 tons (13.0 percent) for nitrogen, 9,000 tons (1.9 percent) for available P_2O_5, and 32,000 tons (14.5 percent) for K_2O as compared with 1955-56. The trend to mixed fertilizers having relatively lower available P_2O_5 content has caused an annual decrease in the national consump-

Table 3. Principal classes of fertilizers consumed in regions of the United States, year ended June 30, 1957, in 1000 tons.[1] (Preliminary)

Class	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Territories	Total
MIXTURES	361	1,747	4,741	3,297	1,206	1,893	632	56	348	294	14,575
CHEMICAL NITROGEN MATERIALS	12	57	740	307	376	618	412	190	807	144	3,664
Ammonia, anhydrous	—	2	19	35	97	75	106	33	100	1	468
Ammonia, aqua	—	—	—	[2]	2	—	2	16	290	66	375
Ammonium nitrate[3]	7	24	105	124	213	329	141	42	96	—	1,081
Ammonium sulfate	[2]	5	6	92	4	7	76	57	208	62	518
Nitrogen solutions	[2]	3	70	39	52	9	18	2	10	0	204
Sodium nitrate	1	10	273	1	—	149	48	[2]	[2]	[2]	484
Urea	1	3	5	14	7	—	14	21	27	15	107
Other[4]	2	10	260	2	1	50	7	18	77	[2]	427
NATURAL ORGANIC MATERIALS	24	40	19	36	8	2	8	11	319	1	465
Dried manures	4	16	3	6	1	1	2	10	251	1	293
Sewage sludge, all	6	14	6	23	2	2	3	1	60	—	115
Tankage, all	3	9	3	—	—	—	0	—	2	0	17
Other[4]	11	2	6	7	5	1	3	[2]	7	0	41
PHOSPHATE MATERIALS	32	91	114	702	527	269	228	142	247	18	2,370
Ammonium phosphates[5]	0	1	1	9	110	1	84	54	125	2	387
Basic slag	0	0	23	0	0	136	3	0	0	0	162
Phosphate rock & colloidal phosphate	[2]	7	28	548	211	17	12	0	2	4	829
Superphosphate: 22% and under	30	79	55	68	50	98	79	22	77	7	566
Over 22%	[2]	[2]	[2]	64	140	2	46	—	24	5	282
Other[4]	2	4	5	14	15	15	3	65	20	1	144
POTASH MATERIALS	2	7	85	179	43	71	38	3	12	18	457
Potassium chloride	2	4	39	174	42	53	38	1	6	15	373
Other[4]	1	3	46	4	1	18	1	2	6	2	84
PRIMARY NUTRIENT FERTILIZERS	430	1,943	5,698	4,521	2,160	2,852	1,318	401	1,734	474	21,531
SECONDARY & TRACE NUTRIENT MATERIALS	[2]	5	95	1	2	2	3	26	792	3	929
Gypsum	—	—	91	—	2	[2]	[2]	20	758	0	871
Other[4]	[2]	5	4	1	[2]	2	3	6	34	3	58
NOT CLASSIFIED	[2]	0	1	12	4	1	2	0	4	[2]	25
ALL FERTILIZERS	431	1,948	5,794	4,534	2,166	2,855	1,323	427	2,530	477	22,485

[1] Due to rounding, totals of items may not add to column or class totals.
[2] Less than 500 tons.
[3] Minor quantities may have been used for other purposes than fertilizer.
[4] Includes quantities undesignated by kind.
[5] Includes all grades: 11-48, 11-50, 13-39, 16-20, 20-52, 21-53, and 27-14 reported either as mixtures or materials.

tion of available P_2O_5 since 1954-55 in spite of the increased use of higher analysis phosphate bearing materials.

The increase in tonnage of plant nutrients was highest in the West North Central and East North Central regions. Their combined tonnage showed an increase for nitrogen, 89,000 tons; available P_2O_5 26,000 tons; and K_2O, 49,000 tons.

The national weighted average of the primary plant nutrients contained in mixed fertilizers as shown by this preliminary analysis in 1956-57 was for nitrogen, 5.77 percent; for available P_2O_5, 12.16 percent; for K_2O, 11.55 percent, and for the total of these nutrients, 29.48 percent. The corresponding values in the preceding year were 5.39, 12.08, 11.20, and 28.67 percent. The proportionate increase was highest for nitrogen and lowest for P_2O_5.

Table 4. Consumption of primary plant nutrients, year ended June 30, 1957, in 1,000 tons. (Preliminary)

Region[1]	Content of mixtures				Content of all fertilizers[2]				Percent change in all nutrients from 1955-56
	Nitrogen	Available P_2O_5	K_2O	Total	Nitrogen	Available P_2O_5[3]	K_2O	Total	
New England	25	42	43	110	30	49	45	124	5
Middle Atlantic	99	207	197	503	118	225	200	543	4
South Atlantic	208	425	452	1,085	382	442	481	1,305	—3
East North Central	203	504	504	1,211	316	576	613	1,505	6
West North Central	91	221	170	482	282	348	196	826	11
East South Central	89	214	196	499	300	258	232	790	3
West South Central	49	92	64	205	234	156	87	477	2
Mountain	7	10	2	19	87	60	4	151	11
Pacific	35	38	22	95	307	105	34	446	7
CONTINENTAL U.S.	806	1,753	1,650	4,209	2,056	2,219	1,892	6,167	4
Territories	35	19	133	87	69	24	43	136	18
Total: 1956-57	841	1,772	1,683	4,296	2,125	2,243	1,935	6,303	4
1955-56	797	1,785	1,655	4,237	1,933	2,247	1,875	6,055	0
1954-55	804	1,821	1,658	4,283	1,960	2,284	1,875	6,119	1

[1] The States comprising the regions are listed in Table 1.
[2] Content of mixtures and direct application materials.
[3] Includes, as available P_2O_5, 2 percent of the colloidal phosphate and 3 percent of the phosphate rock marketed for direct application.

Factors which influence farmers to use or not to use fertilizer

Almost everyone associated with the fertilizer industry or with soil fertility research or extension is tremendously interested in what causes farmers to adopt or not to adopt sound fertilizer practices. Although we all have some ideas on the subject, it is probable that our interest exceeds our real knowledge by a wide margin in this field. Hundreds of millions of dollars, both public and private are spent annually in agricultural research and education. But we have not spent much money or effort in studying the factors which influence the object of our research and education expenditures —the farmer himself.

There has, of course, been some good work in this field with much of which you are undoubtedly familiar. We feel that an exhaustive study now being completed by National Analysts, Inc., of Philadelphia, for the National Plant Food Institute, will make a major contribution to the subject of farmer motivation.

The National Analysts' study is specifically aimed at finding out what factors influence farmers to use fertilizer at high medium and low rates and what factors influence farmers not to use fertilizer. The study is built around a carefully designed questionnaire, composed of 128 questions. The questionnaires have been completed by trained interviewers through personal interviews with farmers.

A great deal of effort went into the construction of the questionnaires. It involved the combined efforts of a committee of fertilizer industry, executives, a group of industry agronomists, and the staffs of both the National Plant Food Institute and National Analysts, Inc. Several men, familiar with Mid Western conditions, participated.

Everyone who has worked with National Analysts has been tremendously impressed with the manner in which they have gone about the job. The way in which they have designed questionnaires to cross check answers, the pre-testing of the questionnaire under field conditions, the statistically sound method of sample selection, and their thoroughly objective scientific approach all have contributed to the confidence we feel in their work.

The final report, broken down by geographical regions and accompanied with analysis and recommendations will be ready in about two weeks. It will then be presented to our Industry Study committee and thereafter distributed in accordance with the committee instructions. Zenas Beers and Dr. M. S. Williams will make a further thorough analysis of the study from the standpoint of its significance in the Mid West. Mr. Beers, as you know, is currently executive secretary of the Middle West Soil Improvement Committee and as of January 1, 1958, will become Mid Western regional director of the National Plant Food Institute. Dr. Williams, a graduate of Purdue, is chief agricultural economist for the National Plant Food Institute, and has worked with this study from the time it was first conceived. Messrs. Beers and Williams will jointly present, on February 14 at the annual conference of the Mid Western Agronomists and Field Representatives in Chicago their analysis of the study together with recommendations for action by interested groups in the Mid West.

In the meantime, I have a few personal conclusions to present, based on my own study of the preliminary Mid Western statistics which National Analysts has made available to us. I should emphasize that my conclusions are unofficial, preliminary and possibly premature. Here they are:

What Influences Farmer

Soil test recommendations.
Reasonable credit terms.
Demonstrations.
Mass media—particularly to arouse interest and to reach those who otherwise would not consult usual sources.

Who Influences Farmer

Agricultural experts (particularly with soil tests)
Neighbor
Dealer
Others.

Basic Conclusions

Farmers believe authenticated information from their Agricultural College, County agents, etc., distrust unsubstantiated claims.

Soil tests are a most important factor.

Demonstrations are approved by farmers and influential with all classes of farmers.

Dealers have the best chance of any group to talk to farmers about fertilizer.

Mass media can do one of its biggest jobs in urging farmers to take advantage of the information and technical assistance available.

Some Actions Suggested by the Survey

Action to be Taken	By Whom
Push Soil tests	Everyone concerned with soil fertility
Sell on the basis of unbiased, scientific findings	Dealers and salesmen
Provide dealers and salesmen with acceptable, clear and concise informational material	College of Agriculture
Sell the importance of soil fertility and urge farmers to consult informed sources	Mass media
Step up demonstration activity on local basis	College and Industry
Cooperate closely with credit agencies	College, Industry, Dealers
Collect and evaluate information on weather risks	College of Agriculture

Undoubtedly Messrs. Beers and Williams will have a far more penetrating and complete analysis to offer you next February. I think we can all look forward to their coming presentation with confidence that it will be of great importance to the fertilizer industry, college personnel and others interested in soil fertility.

Presented by W. R. Allstetter, vice president, National Plant Food Institute, at the Soils and Fertilizer Short Course, University of Minnesota, St. Paul, Minnesota, December 9, 1957, and at the North Dakota Dealers Conference, North Dakota Agricultural College, Fargo, North Dakota, December 11, 1957.

Cotton Conference Topics of interest to the fertilizer industry

Several topics of interest, directly and indirectly, to the fertilizer industry were on the program of the Beltwide Cotton Production Conference held at Memphis, Tenn. December 12-13.

Here, in summary form, are some of the more directly interesting subjects considered at the conference:

GIBBERELLINS

Many cotton growers will be using gibberellin, the new plant growth stimulant, on parts of their acreage in 1956 to check out reported advantages of Beltwide experiment station and industry research, according to **Dr. Jim Merritt,** Merck & Co. scientist.

Among benefits cotton growers of the Mid-South and western cotton growing areas can expect are: **1)** Treating seeds for better stands of cotton resulting from increased and earlier emergence; **2)** spraying for increased boll set; and **3)** higher yield or longer fiber.

Several varieties of cotton grown in these areas have responded favorably in research conducted this year. The ability of these varieties to maintain growth produces a larger plant capable of setting more bolls and longer fiber.

Major cotton varieties on the eastern seaboard seem to respond similarly when weather is adverse. But under ideal growing conditions their determinate growth habit has limited their production of fiber and apparently cannot be stimulated by spraying with gibberellins.

Extensive research on gibberellin will be continued by colleges, experiment stations, and industry. Dr. Merritt said his company is expanding its grant-in-aid program during 1958 along with research by its own scientists to increase the fund of knowledge in this field. Prime objectives in 1956 are: 1) Develop more exact timing and rates of application to improve fiber and yield; and 2) Establish large-scale field tests among growers so that the effects of gibberellin can be observed under practical conditions.

SKIP-ROW PLANTING

The prospect of increasing cotton yields in the rain belt through skip-row planting was outlined by **James B. Dick,** agronomist at the Delta Branch Experiment Station, Stoneville, Miss., who cited research studies that showed a 73 per cent yield increase in the "plant four, skip four" planting method. Planting two rows and skipping two rows produced a 130 per cent increase in yield over the traditional solid-row planting. These figures apply only to the acreage actually planted to cotton.

He pointed out that skip-row planting assists in weed and Johnson grass control and that there are also benefits obtained from fallowing the land.

Dick said the primary disadvantage of skip-row cotton planting is that of cost. Land preparation, cultivation, and insecticide costs are higher. But where increases of at least half a bale per acre are possible, skip-row planting is usually profitable. However, the agronomist stated that careful supervision is necessary in land preparation, planting, and fertilization.

Dick listed three factors that currently limit skip-row cotton planting in the rain belt: **1)** the Agricultural Stabilization and Conservation Committee requirement of four-row minimum width space in acreage control measurements; **2)** a large proportion of good cotton land is necessary before the farmer can afford to put one-half of the acreage in fallow; and **3)** alternate cash crops may offer the farmer a greater increase in net return than skip-row cotton planting.

"In the last analysis," Dick said, "the amount of available land, land use, and good farm management must necessarily determine the place of skip-row planting in the rain belt."

IRRIGATION

The Conference was told that use of supplemental irrigation in humid areas probably has more impact on cotton farming systems than any technological innovation since the introduction of the all-purpose tractor by **Dr. Grady B. Crowe,** agricultural economist at the Delta Experiment Station, Stoneville, Miss., who stated that using supplemental irrigation with maximum efficiency will require modification of almost all production inputs and all operations in the crop production sequence.

Pointing out that those crops with high gross values per acre yield the greatest results to the use of supplemental irrigation, he described the present cotton growing system in the Mid-South as a "natural in this respect." He went on to say that the farmer should base his decision on supplemental irrigation on whether he can irrigate more than one crop and so spread overhead costs and increase efficiency.

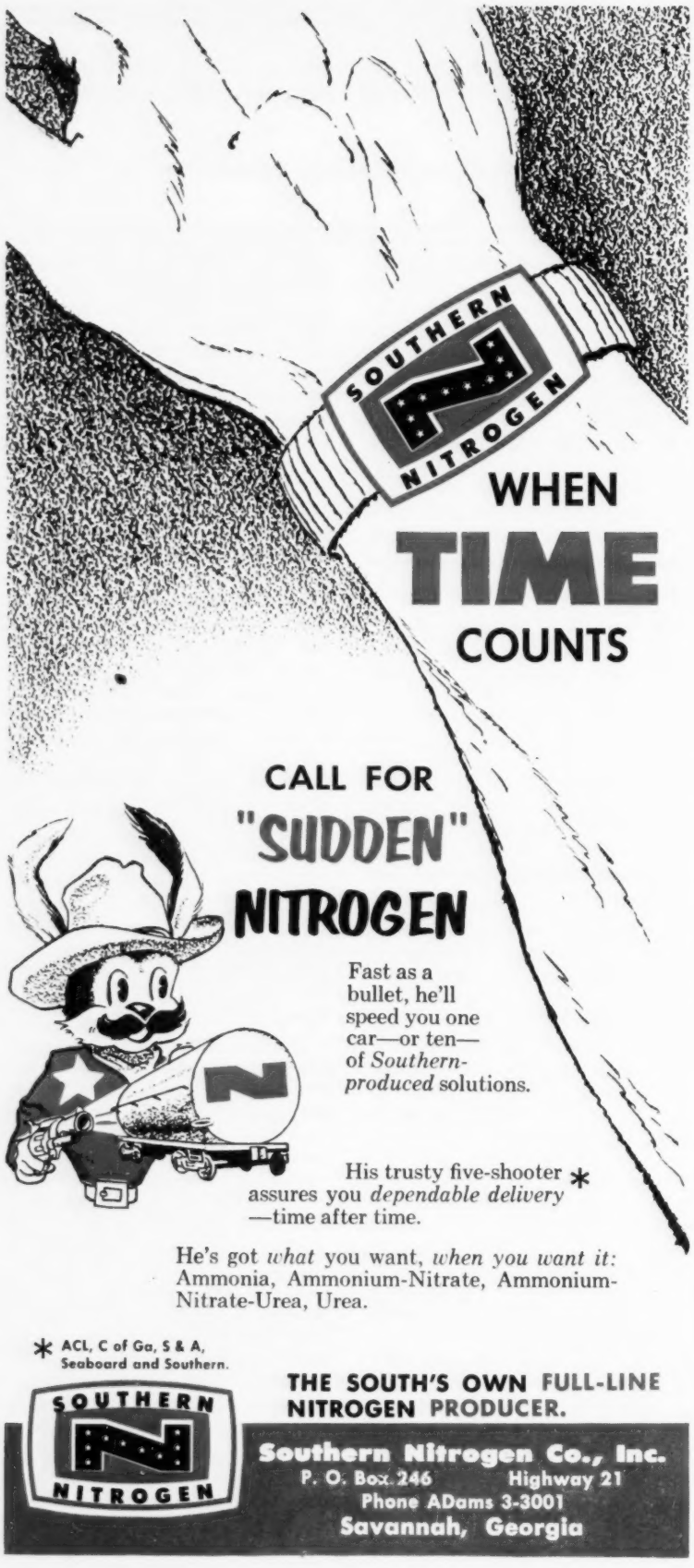
Dr. Crowe said that the use of supplemental irrigation may help reduce the traditional production uncertainties in humid areas. He cited research figures showing that, in a three year test in Alabama, non-irrigated cotton yield varied 35 per cent while that of irrigated cotton varied only two per cent.

The Mississippi economist told the conferees that the decision to use supplemental irrigation was not enough . . . that the decision must be accompanied by better management and greater labor skill. Dr. Crowe went on to point out that there must be a dependable and fairly cheap source of water to irrigate efficiently. In the Mississippi Delta area, he said, when water is pumped from a well, it can presently be applied at a cost of 25 to 35 cents per acre inch. Equipment cost is a big factor, he said, and estimated that the average cost of row crop irrigation in Mississippi is about eight dollars per acre per application.

Dr. Crowe emphasized that the use of supplemental irrigation means that the whole range of production practices must be reviewed and that certain practices, such as fertiliza-

Gibberellic Acid May Cause Problems

The Cotton Trade Journal recently commented that Gibberellic Acid may prolong the cotton season and . . . "What a surplus that would make." On the plus side, however, they suggest that cotton staple may be lengthened by the new acid. Very little research has been done on this, but it looks as though amazing results may develop.


SOUTHERN
NITROGEN
WHEN
TIME
COUNTS
CALL FOR
"SUDDEN"
NITROGEN
Fast as a bullet, he'll speed you one car—or ten—of *Southern-produced* solutions.
His trusty five-shooter * assures you *dependable delivery* —time after time.
He's got *what* you want, *when you want it:* Ammonia, Ammonium-Nitrate, Ammonium-Nitrate-Urea, Urea.
* ACL, C of Ga, S & A, Seaboard and Southern.
SOUTHERN
NITROGEN
THE SOUTH'S OWN FULL-LINE NITROGEN PRODUCER.
Southern Nitrogen Co., Inc.
P. O. Box 246 Highway 21
Phone ADams 3-3001
Savannah, Georgia

tion, and weed, disease, and insect control must be intensified.

He concluded, "Certainly the increased efficiencies growing out of irrigation would lower production costs and strengthen cotton's competitive position so far as price is a factor. And if market outlets could be found, the higher profits and wages resulting would mean improvement in levels of living for those who produce cotton."

FERTILIZATION PROGRAM

A team approach to fertilization is helping Georgia cotton farmers become more efficient, **Dr. Ralph L. Wehunt,** soils and fertilizer specialist with the Georgia Extension Service, who said an "intensified soil fertility program" is now under way in six counties in the south central extension district. Led by county agents with assistance from the state extension staff, the project is part of a $200 million soil fertility program throughout Georgia.

Primary objectives of the fertility program are **(1)** to acquaint farmers and business leaders with the major role of fertilizers and lime in making a better Georgia agriculture; **(2)** to assist farmers in carrying out the best-known fertilizer and lime practices; and **(3)** to increase farm, industry, and business income by sound fertilization methods.

The educational program is centered around three basic factors—need, facts, and action—Dr. Wehunt said.

Among the facts which will be presented on an individual county basis are: **1.** Successful crop production depends largely on wise use of fertilizer and lime. **2.** In some counties approximately 80 per cent of the soils are low in potash and 90 per cent are too acid for best crop production. **3.** Figures on present fertilizer use, and that needed for the most profitable production, will be shown. Also, the fact that many farmers are using the wrong kind of fertilizer will be emphasized. **4.** The average yield per acre is too low. Cotton yields could be increased 40 to 50 per cent in the counties by more efficient fertilization. **5.** Fertilizer is one of the farmer's biggest bargains.

Dr. Wehunt said the biggest job to be done is "to develop programs of action to release this storehouse of knowledge on farms where it can be put into effective use." He then presented a list of "action ideas" which have proved worthwhile.

The action ideas included organization of groups and committees to

support the program. Wide use of exhibits, radio, newspapers, television and films to get information to people was also urged.

"Our primary goal is to help farmers become more efficient, to raise their standard of living, and to enlarge their chances of success," Dr. Wehunt said. "The need to encourage efficiency of cotton production, as well as other crops, was never more important than today."

YUMA HAS NEW CROP CHEMICAL GROUP

The fertilizer and insecticide dealers of the Yuma, Ariz., area have formed the Yuma Area Agricultural Chemical Assn. It is headed by Jce McQueen of Agro-Phosphate, president; Richard Jacoby of Walter Jacoby and Son, vice-president; Jce Atmar of Atmar Distributing Co., secretary-treasurer.

Elected to the board, in addition to the officers, are Glyn Franks of Desert Fertilizers; G. H. Richardson of Mohawk Fertilizers.

PAC N. W. NAMES CONVENTION DATES

At a recent board meeting, the 1958 annual convention of the Pacific Northwest Plant Food Association was pin-pointed for October 23-24 at Gearhart, Oregon, with a banquet the second evening—but no speaker. Instead speakers will hold forth at one of the two luncheons.

Dealers Day Jan. 22

Pacific Northwest will hold its Oregon Dealers Day at Corvallis cn January 22. Paul Willard, Don Campbell, Karl Baur, Grant Braun and Todt Tremblay are putting the program together.

Regional Conference July 8-10

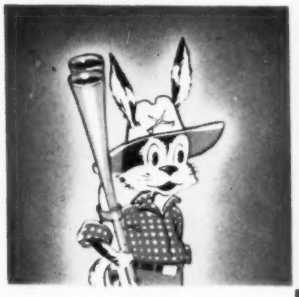
The Regional Fertilizer Conference will be held at Pocatello July 8-10, and Western folks are asked to fit their vacation plans so they can be there then.

Good Washington Dealer Meet

Two well-attended Fertilizer Dealer Days were held in Washington with 50 at the first, 60 at the second. Doc Harston of Washington State and County Agent Elwood Dull are awarded orchids for the program, while more of the same go to Sid Martin who worked hard on attendance.

WANTED

BY FARMERS EVERYWHERE



DOUBLE BARRELED DIXIE

and

MISS MIXED FERTILIZER

WATCH FOR THEM!

They'll marry-up this Spring and produce

BIG YIELDS AND PROFITS

Report all known facts about them to

YOUR CUSTOMERS

This will earn you a

BIG REWARD

RECOMMENDED MIXED FERTILIZERS GRADES & RATES

FOR MORE INFORMATION, WATCH FOR THE

SOUTHERN DIXIE NITROGEN

SOUTHERN NITROGEN CO.

Spring Ad Campaign

With new D-K Continuous Cone Mixer and Den

Tennessee Farmers Co-op Goes Modern

One year ago, Tennessee Farmers Cooperative in Lavergne, Tenn. decided to modernize their plant for the manufacture of normal superphosphate and install the Davidson-Kennedy continuous den.

The reasons for the change were many—their neighbors were tired of nasty fumes, TFC found the old concrete box den had to be rebuilt every year, production costs were high, and it was impossible for the men to work with the high concentration of fumes.

After checking the many types of dens, TFC decided on the Davidson-Kennedy den with the cone mixer. The machinery was placed on order the beginning of November. The first week of December 1956, the old box den was torn down and removed from the plant. During the month, concrete footings and building foundations were prepared. On the first of January, erection of machinery began and it was enclosed with a new addition to the building. The second week in February, the plant was complete and ready to produce superphosphate at the rate of 30 tons per hour.

After one year of operation, Chester Venable of Tennessee Farmers Cooperative said the den has produced 27,000 tons of super and they are very pleased with the operation. Allen Pogue, plant superintendent, has stated that many visitors to their plant say they have the best super in this part of the country, both because it is very porous and the ammoniation rates are high.

Using 75 BPL rock dust which passes 90% through 100 mesh and 60° Be' sulfuric acid, they have found the following analysis of green super within an hour after it is made: Moisture 8.23; T. P. A. 21.25; I. P. A. 2.10; A. P. A. 19.15; Free Acid .60.

A typical sample tested when it is one day old is as follows: Moisture 6.00; T. P. A. 22.90; I. P. A. 2.50; A. P. A. 20.40; Free Acid .29.

Other samples tested after one day old show a variation from 19.65 A. P. A. to 20.60 A. P. A.

A number of dens of this type are now producing both enriched and triple super phosphate very successfully, according to the plant designers.

Rock dust is unloaded with existing facilities from hopper-bottom cars and then moved by screw conveyor to storage. From storage the dust is fed by another screw conveyor to the dust elevator which feeds the surge hopper above the Omega gravimetric feeder. The surge hopper contains a mechanical agitator to prevent the rock dust from bridging. The gravimetric feeder has a variable-speed rotary vane feeder to prevent the rock dust from flushing. The Omega gravimetric feeder, completely automatic and after it is set to the proper weight, feeds continuously within a plus or minus 1% variation. The feeder does not require constant attendance; if it goes out of balance, a red light flashes on the board at the cone mixer to advise the operator.

The rock dust is conveyed to the cone mixer through an inclined dust-tight screw conveyor. The cone mixer is made of a special cast iron to resist corrosion and wear. The throat of the newer cones contains a replaceable sleeve to give optimum mixing conditions at all times. This sleeve can be replaced easily at a very nominal cost.

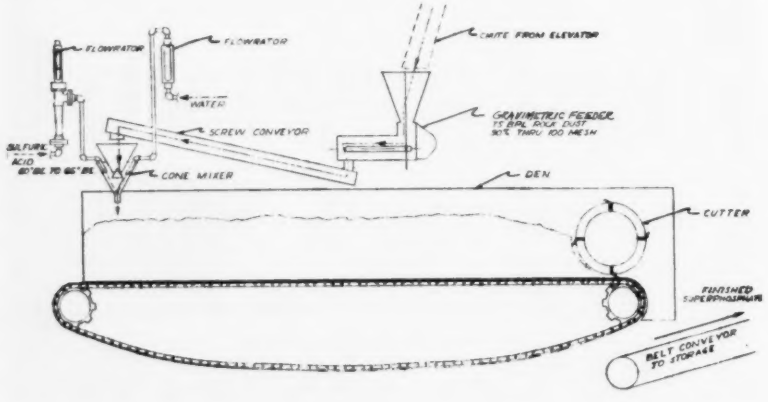
Sulfuric acid 60° Be' is pumped from the storage tank to the cone mixer through four nozzles properly spaced in relation to the two water nozzles to give proper mixing, as the rock dust is fed to the center of the cone. The flow of acid and the water is controlled by rotometers which are kept on the proper setting by the operator at the same time he tends the cone mixer. The rotometers are manually controlled by adjustment of acid and water valves.

The freshly mixed superphosphate goes into the continuous den at the rate of about 35 tons per hour. Loss of moisture in curing gives a finished material production of about 30 tons per hour.

The continuous den is made with specially-designed slats to eliminate leakage, and sides of the den are

Acidulation Plant Flow Sheet

Design adaptable for 20 to 40 tons/hr. units; addition of phosphoric acid at cone mixer will give enriched or triple superphosphate; range of available phosphoric acid—20% thru 46%.



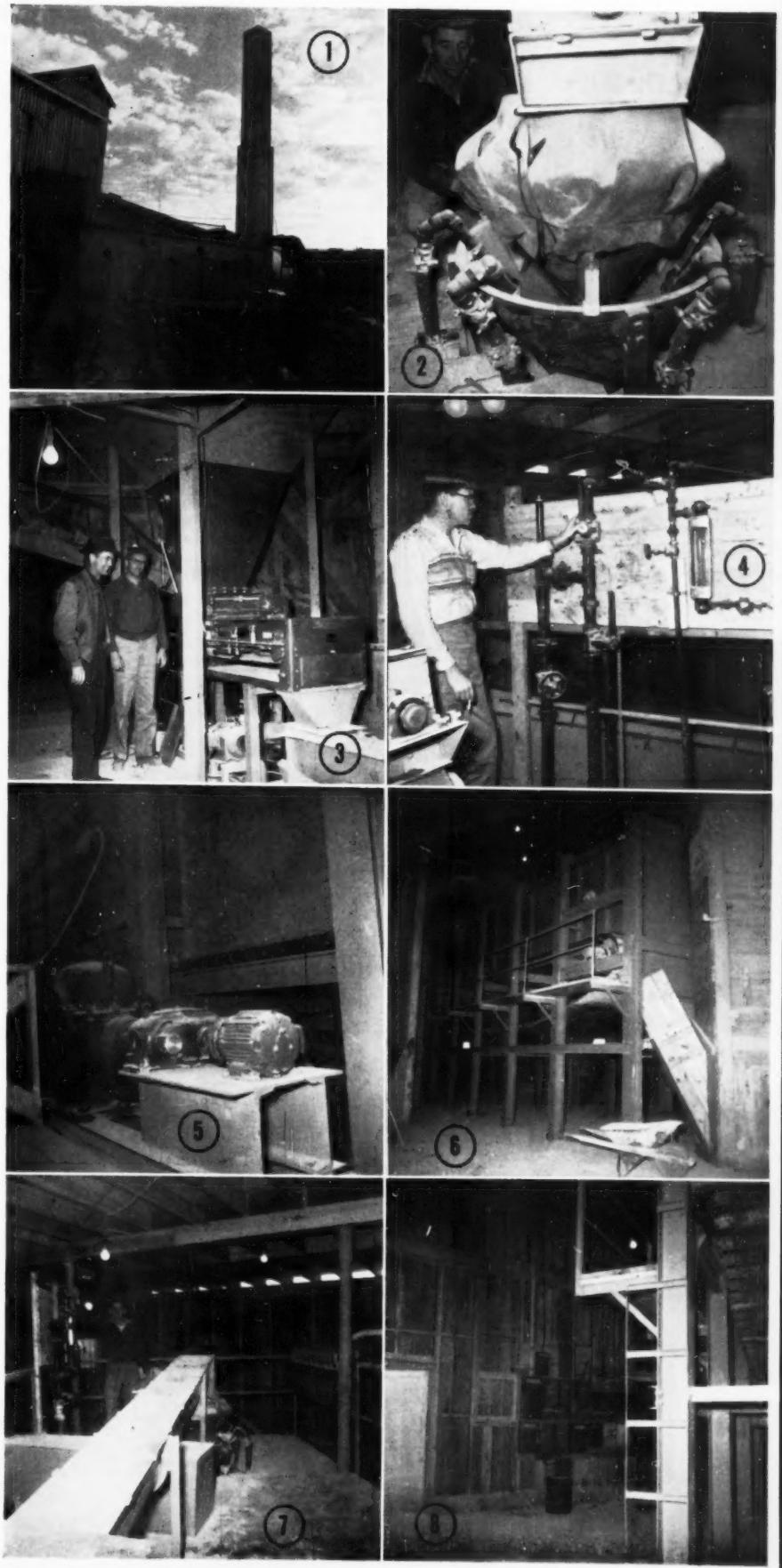
steel with a cresoted wood liner to help eliminate corrosion and minimize wear.

The den is equipped with a variable speed drive so it can be used under many diversified conditions. After the material is in the den approximately one hour, it is cut off with a rotating cutter the full width of the den. This cutter is powered by a 7½ h.p. gear motor. The cutter teeth on newer dens will be made of special cast iron to minimize corrosion and wear. After being cut out of the den, the material goes directly into a bucket elevator, then to the storage conveyor and ultimately to storage.

The fume scrubber system in this plant is rather unique in that it is made almost completely of concrete. It has six compartments, separated by wooden baffles with two small-diameter holes in each. Directed into each hole is the spray of the nozzle. A fan forms an induced draft in the stack and does not have any corrosive fumes passing through it. Both the stack and the concrete scrubber are coated with a corrosive-resistant coating on the inside.

All electrical equipment in the plant was wired with neoprene covered cable to eliminate electrical failure due to corrosion.

In conclusion, TFC's fume problem has been eliminated. According to Mr. Venable, the scrubber is doing an excellent job. So far, maintenance costs on the den have been very low. Requiring only one operator, the Davidson-Kennedy den produces continuously at 30 tons per hour, a big factor in reducing production costs.



1. Six-compartment concrete fume scrubber. Fan at right forms induced draft.

2. Cone mixer thoroughly mixes rock dust, sulfuric acid & water.

3. Bob Hessel (left), chief engineer at Davidson-Kennedy, and Plant Superintendent Allen Pogue observe Omega gravimetric weigh feeder as it automatically feeds rock dust.

4. Allen Pogue adjusts acid and water rotometers.

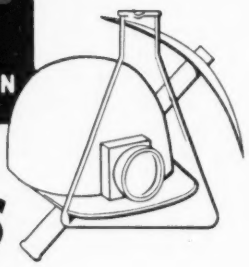
5. Den drive consisting of a double worm gear, variable speed drive, controlled torgue coupling and a 1 h.p. totally-enclosed motor.

6. View of 30 ton hour Davidson-Kennedy den discharging into product elevator.

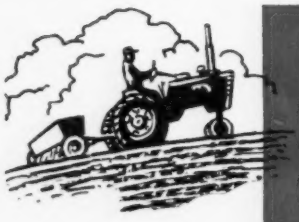
7. Screw conveyor feeding the cone mixer. Worker adjusts rotometer. Note all push-button controls on left side of den convenient to operator.

8. Ladder and platform to easily service the den. Electrical controls in background.

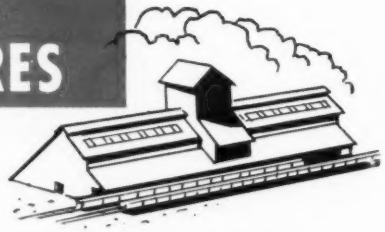
TENNESSEE CORPORATION



PRIMARY PRODUCERS
OF
FERTILIZER CHEMICALS



MANGANESE SULFATE
MANGANOUS OXIDE
COPPER SULFATE
ZINC SULFATE
IRON SULFATE
MINERAL MIXTURES



We have manufactured and maintained a consistant research program in the field of nutritional trace elements and their application to fertilizers for more than thirty years. Our background and basic position in this field is your assurance of a plentiful supply of quality materials.

YOU cut cost with combined carloads from one basic source.

YOU can save money, time, plant space and effort through the use of our custom formulated mineral mixture service.

WE back up our products with service, research and technical assistance.

NUTRITIONAL TRACE ELEMENTS ARE OUR BUSINESS

Foliar Nutritional Products Include
NU-IRON, NU-Z, NU-M, ES-MIN-EL

Make request on your Company letterhead for samples or literature.

TENNESSEE CORPORATION

617-629 Grant Building, Atlanta, Ga.

ALABAMA

Marengo Fertilizer Co., now in full operation at Demopolis, turns out mixed fertilizers, 5000 annual tons; distributes fertilizers, nitrates and insecticides. Special services include refilling of bags, custom mixing, lcl limestone, application of Uran liquid nitrogen. The plant is locally owned by 74 stockholders, with Mike Simpson principal stockholder and manager.

FLORIDA

Wilson-Toomer have opened a warehouse at Live Oak to serve Hamilton, Lafayette, Madison and Suwanee counties. J. D. Garden is in charge with Kenneth Tuten as warehouse manager.

* * *

Foremost Fertilizer have begun work on the new building which will house their continuous ammoniation operation. Some of the equipment is already on hand. Machinery and building will run around $100,000 according to Byron Herland, president, and should be in operation by early March.

MINNESOTA

Midland Cooperatives, should be about ready to go into operation this month with their new blending plant at Waseca, which will make a specialty of tailor-made fertilizer for bulk distribution. The plant is one story, with storage for 300 tons, a 2-ton blender, scale, hopper and elevator.

MISSISSIPPI

Mississippi Federated Cooperatives have awarded contract for their $325,000 plant at New Albany to Mitchell Engineering. The plant is intended to produce 30,000 annual tons of mixed goods, according to J. L. Woodall, head of the fertilizer division of MFC.

* * *

Niagara Chemical will build a new crop chemical building in Greenville, to consolidate their production of liquids in Pine Bluff and their dusts near New Orleans. Machinery will come in from these points and from Wyoming, Ill. Frank McHan production manager; Horace W. Lee, zone manager; John Camara, auditor, are the personnel so far announced by this division of Food Machinery and Chemical. The plant is expected to operate on a 2-shift schedule.

MISSOURI

Monsanto is now building expanded laboratory and greenhouse facilities adjacent to what the local press has called their "spreading, cactus-like corporate general offices" in St. Louis. Planned for mid-1958 completion, the new unit is intended to provide facilities for a 75% personnel increase in crop chemical research.

The structure includes a 2-story office and laboratory building, with 8 greenhouses, plus 1500 square feet of receiving room space.

NEW YORK

Niagara Chemical suffered a fire, apparently started by spontaneous combustion at their Middleport crop chemicals plant. A corner of the building was damaged.

PENNSYLVANIA

Organic Corp. of America and the City of McKeesport had not yet come to an understanding as we went to press. Organic owns a now idle garbage disposal plant there. The plant is located on city land, under a 10-year contract. The city claims this contract was violated when Organic shut down in April last year, and has gone to court to seize the plant which is valued at $25,000. Organic say they will move the plant by January 6 if city officials do not accept their most recent operating offer. Doris Duke had not, at last report, picked up the option we reported here in December.

Swift & Co.'s plant food division is introducing this floor stand with customer access from all four sides. It was created for them by the specialty division of the Container Corp. of America.

SOUTH CAROLINA

Independent Guano Corp., Greenville, went out of business with the end of the year, according to word from its president, S. Avery Smith.

TEXAS

Houston's City Council has approved plans to spend $29,000 to enlarge their sludge disposal and fertilizer plant.

AUSTRIA

Linz Nitrogen Works, is beginning production of urea, with a preliminary capacity of 14,000 tons; they will soon put in service a 20,000 ton mixing plant. For this year they plan an increased annual production of a million tons, made up of 700,000 tons of nitrogen, 80,000 of superphosphate, 70,000 of sulphuric acid.

CANADA

Shell Oil of Canada is building, for early 1958 completion, a $60,000 plant to produce a wide range of pesticides.

FRANCE

California Spray-Chemical has completed its $1,500,000 fungicide plant near Marseilles, and the subsidiary is now a corporation in its own right with a capitalization of 265,000,000 francs. It is known as California Spray-Chemical Compagnie Francaise, S. A.

PAKISTAN

Duadkhel fertilizer plant in West Pakistan was due to be in production the end of last month. Capacity of 50,000 annual tons of ammonium sulphate and by-product sulphuric acid.

SPAIN

Hidronitro expects its sulphate of ammonia plant at Tarragona to be ready by mid-year with production of 30,000 annual tons.

Sackett Equipment PAYS ITS OWN WAY

Sackett Builds The Equipment You Need

- **Continuous Granulating Units**
- **Plant Modernization Programs**
- **One Man Batch Weigh Systems**
- **Mixing and Shipping Equipment**

Aerating Equipment
Automatic Control Equipment
Basing Units
Belt Conveyors
Bucket Elevators
Centralized Control Systems
Continuous Acidulating Processes
Continuous Ammoniating Systems
Conveyors
Coolers
Crushers
Disintegrators
Dry-Mixing Units
Dust-Arresting Equipment
Fume Scrubbing Systems
Hoppers and Spouts
Materials Handling Equipment
Milling and Screening Units
Multiple Hopper Batching Systems
Oil Fired Dryers
Plant Mechanization Systems
Pneumatically-Operated Gravity Batch Mixers
Pneumatically-Controlled Valves
Pulverizers
Sackett Timken Bearings
Sacking Units
Scales
Screens
Shipping Units
Shuttle Belt Conveying Systems
Tailing Mills
Vacuum Condensing Systems

GET THE RIGHT ANSWER TO YOUR PRODUCTION PROBLEMS get Sackett

SACKETT

THE A. J. SACKETT & SONS CO.
1727 S. HIGHLAND AVENUE
BALTIMORE 24, MARYLAND

Field Experiments Prevent Waste

by Dr. Vincent Sauchelli, *NPFI*

Is it a problem of increasing yields, or the introduction of a new fertilizer, or the quality of crops or a new or modified rotation? The best way to solve it is by a carefully planned program of field experiments. Experience of agricultural workers in all countries emphasizes that such field experiments provide the most acceptable basis for judgment—nothing else can take their place.

Greenhouse and laboratory studies have their place as preliminary phases. They can help in getting certain leads that are useful in organizing the field tests. But laboratory and greenhouse facilities cannot reproduce exactly the many diverse factors which prevail in the open fields, any one of which may critically influence the manner in which a chemical or cultivation treatment or crop variety performs. Laboratory tests of soils, unless closely correlated with field experiment results, can often give misleading, costly information. Hence, the only satisfactory method of finding our answer to the farmer's question —What can one expect of a certain treatment in practice?—is to carry out a good program of statistically designed and appraised field experiments.

These thoughts were jotted down after reading a most interesting paper* on how some so-called technically backward countries have planned and conducted comprehensive programs of field experiments as a basis for fertilizer recommendations. For example, in India field experiments on a large scale in several regions indicated that nitrogen gave a fairly constant response if water was adequate and it paid to recommend a general small application. All farmers doing this would get a profitable return and the fertilizer would not be misused. Also, it had been generally held in India that it did not pay to use phosphate; but a series of well-planned experiments showed regions where phosphate was critical and paid handsomely when applied and it was not wasted where it was not required.

Agricultural China is another example. A series of factorially designed field experiments were carried out throughout central and western China during the last World War years. The results have been used to recommend profitable usage of fertilizers on many crops.

Similar large scale field experiments designed along modern statistical lines have been carried out in Kenya and the Gold Coast with equally satisfactory results.

It is safe to say few of the large, technically advanced countries have made such a large systematic attack as these on soil fertility problems to determine the best fertilizer ratios and rates. Perhaps these countries having a long tradition of fertilizer usage think they know the answers without the extensive field trials. One thing they fail to consider in their complacency is that the nutrient status of a soil is constantly changing, and though what was true twenty or thirty years ago is not true today. New fertilizer materials and new crop varieties have been developed and are now in use which require a new "look-see" regarding fertilizer usage. A region, for example, where fertilizer ratios high in phosphorus have been traditionally used for a generation may today be more in need of relatively higher quantities of nitrogen and potash and perhaps some trace elements. There is need in all regions for a continuing program of field experiments or repeat work on a smaller scale every decade or two in order to become aware of major changes that occur. A soil's nutritional status is not static. Unless this is done the chances favor the inefficent and wasteful use of fertilizers.

*Outlook on Agriculture, Vol. 1, No. 3, 1956.

5% Sales Rise Seen for Chemicals

Talking before the fifth annual marketing conference of the National Industrial Conference Board, John O. Logan, Olin Mathieson vice-president predicted a 5% dollar sales rise for chemicals and allied products in 1958. He believes that the gradual rise which has been underway since 1955 will continue.

HELP YOURSELF TO BIGGER PROFITS

PHOSPHATE PRODUCTION
No other process begins to compare with *way-ahead* Sackett SUPER FLO in making normal, fortified and triple super-phosphates of premium quality at *way lower* cost.

MIXED GOODS MANUFACTURE
Your investment in the latest Sackett Methods of producing conventional fertilizers is *guaranteed* to pay handsome returns. We are anxious to prove it.

MODERNIZATION PROGRAMS
Step ahead of competition by entrusting your fertilizer expansion and modernization facility programs to our care. Many of the most forward-thinking fertilizer producers are glad they did.

GRANULAR FERTILIZER
Sackett Equipment leads the field in Granular Production.
The names of the fertilizer companies who have selected Sackett Granulating Processes above all others, read like a "Who's Who in Industry".

NEW PLANTS
Invest your dollars wisely by having Sackett build your new plant. We do the whole job . . . from the inception stage thru building construction and equipment fabrication to operating plant. See us for guaranteed results.

There is nothing that appeals to a man's reason more than plain facts. And, one plain fact is this . . . you can help yourself to bigger profits by resolving ***now*** to replace wasteful obsolete plant equipment with the latest rock-bottom cost methods as exemplified in Sackett Production Processes and Materials Handling Equipment. Why not start the ball rolling by writing or phoning us today?

THE A. J. SACKETT AND SONS COMPANY
SACKETT EQUIPMENT
BALTIMORE • MARYLAND
1727 S. Highland Ave.

Architects and *Manufacturing* Engineers to the Fertilizer Industry Since 1897.

America's Foremost *Creative* designers & Builders of Commercial Fertilizer and Superphosphate Plants . . . Related Production Equipment

a NEW LOOK at an OLD FEUD

by W. F. PRICE, *General Manager*

Agricultural Chemical Division
Swift & Company, Chicago, Illinois

A little more than a year ago I spoke to the State Control Officials, at their annual meeting, on the subject of oxides and elementals. I must confess that before the talk I felt an uneasiness that some of my audience held the opinion that I was about to commit a treasonable act by opposing a sacred association project.

I should have known better because that fear—like most fears—had no real foundation. Now — I know as well as the next person, that not everyone agreed with the viewpoints I expressed. Nevertheless it was a heartening experience to hear directly from many present that they regard the position I expressed as both tenable and sound.

Today, I must retell the story very much the same as I did a year ago. The basic issues remain exactly the same. I do feel—and with good reason—based upon my correspondence and discussions with control and industry people alike that the climate has changed. Today — and believe me on this point—there is a very real awareness to industry's position and, of course, that is good. We all know in looking back upon certain experiences that it is easy to enthusiastically interest ourselves in a certain project and aggressively crusade for it without regard to consequence because we are convinced that it is good, that it is right, and that because of its obvious virtues to **us**, that it will find universal acceptance.

The subject of the elemental vs. the oxides, when boiled down, is largely a matter of language. It interests me because we must have a common language to be free to express our feelings and thoughts. Speaking the same language, we find common interests, likes, and dislikes. Knowledge, expressed in common language, is the backbone of scientific, technological, and economic achievement.

And here you have the real reason why the simple question, "Shall we change the expression P_2O_5 and K_2O to P and K in our chemical guarantees?" has provoked so much discussion during the past few years.

To find the answer to that question, let's go elementary and examine the pro's and con's and by whom advanced:

The original proposition was presented by your midwestern colleagues, and later endorsed by the four National Soil Research Committees, the Soil Science Society of America, and the Experiment Station Policy Committees for the North Central Region and the Western Region. By any standard of measurement, that is an impressive roster of endorsers. But, looking closer, we find that these groups are composed of the same people, with the same calling—and that means the same viewpoint. They are the agronomic research workers or their administrators: namely, you or your colleagues. I concede that from the standpoint of the working soil scientist there is no question but what the arguments advanced do favor a change from the oxide to the elemental in the guarantee, because elemental guarantees promote:

Simplicity of written and spoken communication;

Uniformity of terminology in expressing nutrient content of soils, plant materials, and fertilizers;

Accuracy in stating the ratios of nutrients in a mixture.

To keep our thinking in parallel channels, keep in mind these benefits are primarily for the soil scientist.

Now—let's turn to the next question—the one that still remains. That question in itself contains **all** the doubts and reservations that industry and others have expressed.

The question: "Will a change to the elemental benefit the farmer and the local dealer, and if so, will the means necessary to extend the benefits justify the ends?"

Stripped down, what if any are the benefits of the change to the most important guy of all? — the farmer.

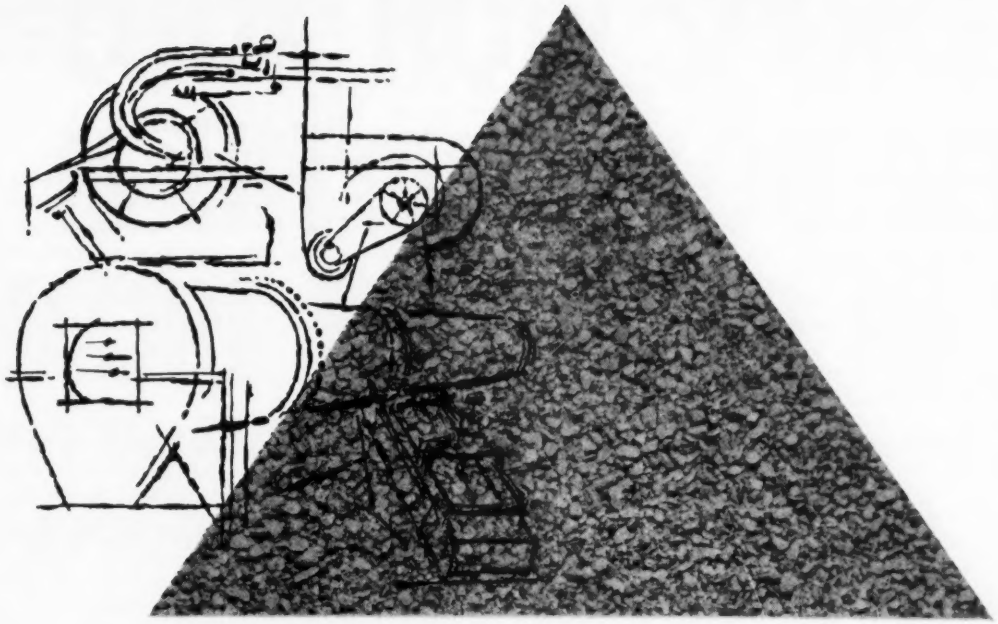
Is a change in terminology (desirable to you) also of equal desirability, and equal utility, and equal convenience to the farmer and the dealer? I need not say who constitutes the largest group affected nor whom, under democracy, legislation must benefit.

If you will but take an objective viewpoint, it must be admitted there has been a notable lack of interest by farm groups on this subject. So far the proposition has come up in both the Iowa and Delaware legislatures, but in neither case have the Grange, the Farm Bureaus, nor any other farm organization supported the action nor lobbied in its behalf. I find that our own customers couldn't care less. They are totally unaware of the lack of simplicity, accuracy, or uniformity. They are not concerned in the slightest about these benefits to you. They buy a 7-7-7 for their groves. They obtain their desired response. You know as well as I that if this same 7-7-7 were to become roughly a 7-3-5 instead, it would not produce more boxes, nor lugs, nor bushels of fruit. But now the dealer has the problem of proving that the 7-3-5 was the old 7-7-7. It is even questionable if an interim period of showing both fractional and adjusted ratios would bridge the educational gap. Assume the gap was bridged, would the change benefit the grower? Certainly here in Florida, the championship state on multiplicity of ratios and minor element guarantees, the welter of ratios and decimals would indeed be a spectacle to behold.

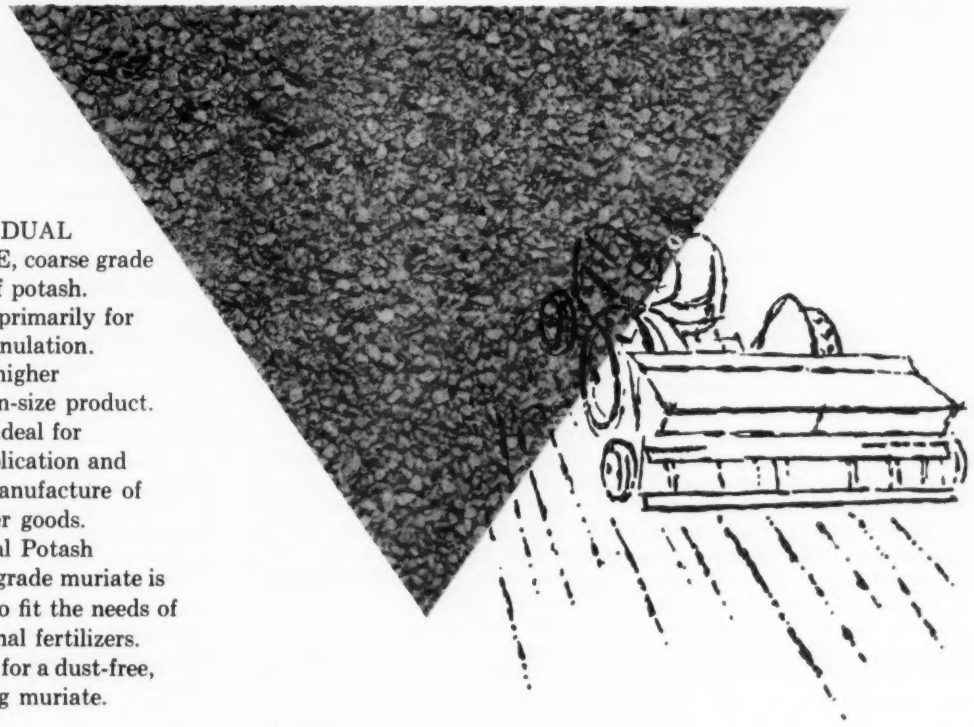
Now I am sure you people already had the complexity of this program figured out, because so far as I know no one from Florida helped to sponsor the elemental idea. As I have already pointed out, it was given birth in the Midwest, where the average state has no more than 20 grades to worry about.

The current change in grain measure from bushels to cwt. can hardly be cited as an argument for the pro-

Talk before Soil Science Society of Florida, December 5, 1957.



LET NATIONAL POTASH SERVE YOU



Here is a DUAL PURPOSE, coarse grade muriate of potash. Designed primarily for use in granulation. It gives a higher yield of on-size product. It is also ideal for direct application and for the manufacture of top dresser goods.

National Potash standard grade muriate is designed to fit the needs of conventional fertilizers. Processed for a dust-free, non-caking muriate.

NATIONAL POTASH COMPANY

205 EAST 42nd ST. • NEW YORK 17, N. Y. • ORegon 9-4950
212 Bell Building • MONTGOMERY. ALA. • AMherst 5-8234

cedure to change the oxides to the elemental basis. Here was not a change to something brand new but merely a substitution to another familiar unit of measure. This change simplified the farmer's daily chore of calculating yields per acre, in figuring feed formulas, in determining truck and trailer loads, and so on. By contrast, the farmer does not have daily association with fertilizers. For example, here in Florida, the average grower uses fertilizers from 3 to 5 times annually, and in other large agricultural areas of the United States it is even less often. The amount of mental effort necessary to change to a strange and new nomenclature as contrasted with the simple problem of bushels to cwt. would be like comparing the Atlantic Ocean to Lake Okeechobee.

As already pointed out, interest on the part of plant food users is simply non-existent. I can assure you it will remain dormant unless the change is forced by law upon the consumer. If the issue is forced, the reaction will be one of confusion, complexity, and resentment.

The fertilizer dealer, the man who must support the county agent and help carry the message to the farmer, would be completely frustrated after his first attempt to explain the new ratios. Can you imagine the reaction of his customer when the dealer says, "The old 1-1-1 ratio has been changed to a 2-1-2 on the new basis. It's not really the old 1-1-1, but a 1-0.44-0.83, but none the less the experiment station people say it will work."

Admittedly this is purely a flight of my imagination, and thank goodness it hasn't happened yet. But those are the types of explanations that could happen under an elemental guarantee, and if this situation should develop, you guess what the farmer, the most important man in this chain, is going to think. He has never bothered himself with oxides and elements, and doesn't want to. All he has had time for in his busy and productive life has been to check the numbers: 4-10-7—9-9-9—4-12-12, quoted in the extension bulletin, or in the farm journal, or hammered on year after year by the county agent, to make sure they correspond to the grade on the bag.

If the elemental change became a reality, the farmer would think we didn't know what we were talking about. In the confusion that is bound to remain for years until the new basis is universal, and the old basis completely a thing of the past, he would most certainly lose faith in us all.

How many years it will take to develop acceptance by the farmer of this new language of fertilizers is an unknown quantity. How many reams of paper for new bulletins explaining the change, how many man-hours diverted from productive work to explaining, or attempting to explain, is equally unknown.

Frankly, I am frightened by the prospect of confusion, of resistance, by the key to agricultural prosperity, the farmer, just because of a capricious change in language.

But frightened or not, let us assume that the change is made, and that after a generation, everybody begins to understand what is meant by N, P, and K. Assume that the libraries are filled with written explanations and justifications. Assume that the frustrated dealers and producers, and the confused farmers of the "generation of oxide reduction" have passed on and have been gathered to their fathers, and a bright uncomplicated new breed is on hand to make, sell, and use this N-P-K product.

Will the elements make clearer what's in the bag, or grow the corn taller than the oxides: Will the agronomists' findings be utilized more quickly and more profitably by the farmers? Will N, P, and K make a more prosperous agriculture? Will that large segment of industry that depends on a healthy agriculture find it easier to render maximum service to its customers at a fair profit?

I think a good answer to these questions is that a mere change of language will not increase our production, knowledge, or prosperity.

Might I suggest that this profitless problem of nomenclature be shelved? There are so many other important projects to work on — to concentrate on the needed development of knowledge and research in the agricultural field, and to disseminate that knowledge and results of research . . . rather than muddying up the waters with an excursion in semantics.

The soil and crop scientists of the nation have provided the basis for a fabulous increase in production per farm worker. The high quality of farm products today is the result of patient and devoted research, and an excellent communication system between the scientist and the farmer. I urge you not to jam the airways and slow down the application of new important discoveries which unimpeded, will lead to a fuller, more satisfying life for us all.

New Limestone Basis Deferred

Backed by the National Agricultural Limestone Institute, the Missouri producers have protested a ruling that was to have gone into force January 1. This would require limestone to be sold on a nutrient, rather than a tonnage basis, and would require a guaranteed analysis as to calcium and magnesium content.

The Missouri producers are not objecting to the ruling, but to its enforcement until present stocks can be moved. The request to the Missouri Agricultural Stabilization and Conservation Committee is for a postponement.

Cyanamid Plant Wins Safety Award

The American Cyanamid Company Fortier plant at New Orleans has received the company's award of merit bronze plaque for its record of 1,400,000 man hours of work without a disabling accident.

The award was presented by Dr. W. H. Bowman, general manager of the company's organic chemicals division. Plant manager Charles F. Bonnet accepted the plaque for the employes.

St. Regis Announces Super Stepped Bag

A new development in the quarter century history of St. Regis Paper Company's bag-making has been announced. They have long made the stepped end multiwall paper bag, developed and patented by St. Regis. They now announce the Super Stepped bag, whose unique construction is that the plies are slit in staggered positions instead of the same position.

We are informed that this construction gives added strength and siftproofness to a bag which was already strong and flexible—adding to strength without losing the flexibility which is so important in handling.

A new and improved valve insert provides smooth operation on the packer tube. This, with improved closure makes a more completely siftproof bag and a cleaner package.

For full details, write St. Regis Paper Co., 150 East 42nd St., New York 17, N. Y.

LOOK HOW SPENCER IS HELPING YOU SELL MORE FERTILIZER IN '58

(Both Mixed Fertilizer and Spencer "Mr. N" Ammonium Nitrate)

Thousands of farmers will see Spencer Chemical Company advertisements in 14 leading farm magazines from now through May! These ads will sell hard on the idea that farmers who use plenty of mixed fertilizer, plus Spencer "Mr. N" Ammonium Nitrate, get higher yields and profits per acre. Nine out of ten farm families in your area will be reached by this sales-boosting campaign! Every ad will tell a success story of a farmer who has used a *complete* fertilization program! So get ready for the extra sales of mixed fertilizer that Spencer's giant advertising campaign will be sending your way — and be sure your dealers have plenty of "Mr. N" on hand to meet this year's demand!

Thousands of farmers will hear farm radio programs sponsored by Spencer! Radio Farm Directors on 20 leading radio stations will urge farmers to use a *complete* fertilization program this year. All during your biggest selling season, these men will sell farmers on the importance of using plenty of mixed fertilizer, plus Spencer "Mr. N" Ammonium Nitrate. Day after day, they will pound home a series of strong sales messages designed to send customers your way. So get ready for extra sales of mixed fertilizer this year — and be sure your dealers have plenty of Spencer "Mr. N" Ammonium Nitrate in stock to meet this year's increased demand!

Why Farmers and Dealers Prefer Spencer "Mr. N" Ammonium Nitrate

Independent surveys prove it, time after time — Spencer "Mr. N" is the nationally-advertised brand of ammonium nitrate that is the outstanding favorite of both farmers *and* dealers. Of course, it's easy to see why: *"Mr. N" will not cake!* Since Spencer "Mr. N" is made in round, uniform prills . . . and packed in polyethylene-lined bags for 100% dryness . . . it stays free-flowing. That means no expensive, special storage facilities are needed to keep Spencer "Mr. N" in first-class condition!

This year, to build an even bigger demand for Spencer "Mr. N", Spencer Chemical Company is launching the biggest fertilizer advertising campaign in the history of the company — a campaign that will sell farmers on using a *complete* fertilization program that includes plenty of mixed fertilizer, plus Spencer "Mr. N" Ammonium Nitrate. So get ready for bigger profits this year, with Spencer's giant advertising campaign sending extra sales your way!

For your mixed fertilizer, insist on SPENSOL (Spencer Nitrogen Solutions)

SPENCER®

SPENCER CHEMICAL COMPANY, Dwight Bldg., Kansas City 5, Mo.; District Sales Offices: Atlanta, Ga.; Chicago, Ill.; Memphis, Tenn.; Kansas City, Mo.; Works: Pittsburg, Kans.; Chicago, Ill.; Henderson, Ky.; Vicksburg, Miss.; Orange, Tex.

America's Growing Name in Chemicals

Winning writers in the nation-wide "Soil Builders Award for Editors" contest, sponsored by the National Plant Food Institute, were honored at the annual meeting of the American Editors' Association in Chicago on December 4. Receiving plaques for writers "who most effectively have carried messages of soil building to their farm magazine readers during the past year" were (left to right) Tom Anderson (left) of Nashville, Tennessee, Publisher of "The Georgia Farmer," who received the award on behalf of his staff, in the category of magazines with less than 300,000 circulation, and Ralph D. Wennblom (right) Associate Editor of "The Farm Journal," Philadelphia, representing the magazine with more than 300,000 circulation. Louis H. Wilson (center), Secretary and Director of Information of the Institute, made the presentations.

The Texas A & M Student Agronomy Society was selected as winner of the "Best Student Agronomy Club in the United States," by the American Society of Agronomy. The award was presented at the annual banquet of the American Society of Agronomy in Atlanta, Georgia, on November 20. The committee in charge of the contest for 1957 was headed by Dr. A. R. Midgley, Head of the Department of Agronomy at the University of Vermont. This is the second time that the Texas A & M Club has been so honored, having won the first annual contest conducted by the American Society of Agronomy in 1952. In addition to receiving the trophy for the Club, Mr. William Wayne Allen, Club President, received a check from the National Plant Food Institute in the amount of $100. Left to right: Dr. A. G. Norman, President of the American Society of Agronomy; William Wayne Allen, President, Texas A & M Student Agronomy Society; Dr. W. H. Garman, Chief Agronomist, National Plant Food Institute.

RESEARCH RESULTS & REPORTS

Placement tests at VPI answer a few questions on small grains. VPI agronomist, J. A. Lutz finds that drilling with the seed seems to be the right answer. Tests were made on oats, 200 pounds per acre of 20% superphosphate from a 10-20-20 fertilizer. Drilled, disked before seeding, and top-dressing were the three methods tested. Disked in ran a pretty good second.

♦

Manure tests in Canada's Grey Wooded Soils substation over a 10 year period show a direct yield increase and tilth improvement,—especially on sandy soils. Due to the scarcity of barnyard manure, they suggest light applications and to field areas where needed, such as "light colored knolls."

♦

9,988 cruciferous plants grown from 92 collections of seed were screened to find, finally a downy mildew resistant broccoli. New York AES at Cornell says this 9,900 to 1 shot is going to pay off for vegetable growers, as they cross with the Puerto Rico variety that was the only truly resistant strain out of nearly 10,000 from 20 countries.

♦

Clay added to sandy soils show increased yields of alfalfa, oats, wheat and corn in tests conducted by Michigan State.

♦

Potash seems to help alfalfa most right after application, the Princeton Experiment substation finds, according to word from Kentucky—but they are testing some more to find if overall yield is affected, or only each cutting fertilized.

♦

Ohio has been having trouble with soybeans and manganese. It seems soybeans needed more in one section, and in other sections there was too much. It turned out that the manganese clings to the soil, and thus will not reach the plants. Phosphorus fertilization helps release the manganese. Mederski and Hoff of the Ohio AES can give you a detailed report.

♦

Deep tillage for corn gets another test this year at Carbondale. University of Illinois has plots plowed 24 inches deep, with a variety of fertilizers. They have also encountered an interesting sidelight on gibberellic acid. Instead of snapdragons growing taller, they grew laterally—quite different from the results other stations report.

Zinc deficiency in onions can be spotted by symptoms outlined by John C. Lingle, University of California, Davis station. The plants may be stunted, the leaves curled and twisted. Bleached splotches may appear on the older leaves, and pale areas between veins on the younger ones. Foliar spray treatment may help, but not always because the erect and waxy leaves shed spray. In such cases, he recommends zinc sulphate to the soil at 50 pounds per acre.

♦

Manganese deficiency in palms is discussed by S. A. Rose of the Florida AES. If palm fronds have that "I've-had-it-look" he says, a soil application of manganese sulphate will often cure the ailing tree. About one half pound of the mineral to smaller palms and up to 6 pounds to larger trees. The ailment is called curly top, curly leaf or frizzle leaf.

♦

Virus that kill bollworms have been isolated at the Canadian Laboratory of Insect Pathology. The virus causes wilt disease in the bollworm—and may save millions for the cotton farmer.

♦

Boron on alfalfa acreage in Kentucky was found by the University's

agronomy department to produce favorable response when properly applied. They point out the economy of this because boron is not an expensive element. They warn, however, that too much boron is toxic to plants, especially tobacco. We suggest you get recommendations direct from Harold F. Miller at the Experiment Station, University of Kentucky.

RESEARCH QUOTES

Dr. R. E. Caldwell, soil chemist with the Florida Agricultural Experiment Station:

As organic matter increases, the soil's "ability to absorb water and plant food is increased. This means that less fertilizer will be needed to maintain any given soil at the same fertility level if larger amounts of organic matter are maintained."

"In most cases it is economically impossible to keep the organic matter of our soils, whether forest or prairie, at their virgin levels. Nor is it necessary. However, a decline of 30 to 40 percent is serious and should not be allowed to progress further, as a definite decrease in crop yields may result . . .

"Proper liming, fertilization and soil condition, along with proper sequence of crops, are important in that they increase yields and thus increase the amount of crop residues which can be returned to the soil.

"Good soil management seeks to adjust the production and harvest of paying crops without reducing the humus supply below a definite level. Any system of agriculture that does not do this is not wise or scientific."

♦

"A good pasture fertilization and management program results in many returns which are often overlooked," says **J. F. Shoulders,** associate extension agronomist, Virginia Polytechnic Institute.

"Such returns as keeping soil in place, building good soil structure, and adding organic matter are often forgotten and the pasture evaluated in terms of meat and milk produced . . .

"Good sod holds soil in place. In an experiment comparing soil loss from a bluegrass sod and from the same soil when corn was grown, the soil loss was 20 tons per acre each year from the corn, while losses from the bluegrass sod were only 608 pounds annually. This experiment was conducted over a 14-year period on a soil with a fall of four feet per 100 feet. The soil is a manufacturing plant. Keeping it at home is profitable . . .

"A good pasture sod adds more organic matter to the soil than plowing under a cover crop or covering the field with manure. . . "benefits of top pasture include the ability of good sod to retain certain plant nutrients and to keep others in a form more easily used by plants."

♦

"The answer (to increased dairying profits) is fertilization and irrigation of pasture land," **Professor C. J. Chapman,** University of Wisconsin, said. "Our experiment shows that a farmer who properly fertilizes and irrigates his pasture can regain not only his original investment in the fertilizer and equipment, but more than an equal amount in extra profit."

Figures released by Professor Chapman show that net value of milk from a fertilized and irrigated piece of pasture was $878.89, compared with $482.26 from a comparable section which was unfertilized and unirrigated.

Pounds of milk produced from the fertilized pasture totaled 29,257, compared with 12,937 from the untreated land. Total returns from the untreated land were $482.26, versus $1,078.89 from the fertilized portion. From the $1,078.89, Professor Chapman deducted $200 for the cost of the fertilizer (charging off 65% of the cost against this year's crop) and $59 for the total cost of water, leaving a net return of $878.89, or a difference in profit of $337.63.

In addition to the benefits during the measured period, the fertilized pasture furnished extra feed for beyond the end of the test, keeping the field in lush production through the grazing season and adding additional profits.

RESEARCH GRANTS.....

OREGON STATE

A $2,100 research grant has been made available by the National Plant Food Institute to Oregon State College, Corvallis, for the purpose of conducting an economic study of fertilizer use, Dr. Russell Coleman, Executive Vice President of the Institute, announced.

The one-year grant will provide an assistantship, under the supervision of Dr. W. G. Brown, assistant professor in agricultural economics, and the study will be made in the college's Agricultural Economics Department.

"The grant is one of several through which the Institute is emphasizing the growing need for a stepped-up program in the field of economics, particularly the economic analysis of agronomic data," Dr. Coleman said.

Assisting Dr. Brown with the study will be J. W. Couston, research assistant in the Agricultural Economics Department, Dr. T. A. Jackson, associate soil scientist, who will represent the Soils Department, and Dr. Wilson Foote, associate professor in farm crops, who will represent the Farm Crop Department. Dr. Jackson, in providing the basic data for the grant, has conducted the experimental work, while Dr. Foote has assisted in the field trials.

ARIZONA STATE

A grant of $1,000 from the California Spray Chemical Corp., Richmond, Calif. has augmented an extensive, four-part research program to study fertilization of crops at Arizona State College.

Dr. Daniel O. Robinson, head of the agriculture division, said the grant will be used largely to employ qualified upper division students to aid in careful plant analysis and strict control of research procedures.

50/50 Liming Method Advocated

R. D. Bronson of Purdue U recommends adoption of a split application technique for limestone, in establishing legumes on acid soils. Plow down half; disk the other half into the seed bed before planting. This, he says, will give the plants favorable conditions for early growth, supplying surface calcium until the roots can reach down to the plowed-down limestone.

Of the 200 chemicals now used on American farms, less than 20% in total volume were available in the 1940's. Prior to World War II only 50 of the 200 were used on US farms.

Stubble-Mulch Tillage ---

Research Finds Benefits, Drawbacks

Stubble mulching—the farm practice of leaving crop residues on the soil surface—is proving generally successful in semi-arid regions of the United States for maintaining crop yields and controlling water and wind erosion, the U. S. Department of Agriculture says.

Results of research to date on this farming technique are reported in a new USDA Technical Bulletin, No. 1166, "A Summary of Research Experience With Stubble Mulch Farming in the Western United States," by Austin W. Zingg and C. J. Whitfield of the Agricultural Research Service.

Studies reported in the bulletin were made in cooperation with Agricultural Experiment Stations of 12 western States and USDA's Soil Conservation Service. The States are Colorado, Idaho, Kansas, Montana, Nebraska, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Washington and Wyoming. Copies of the bulletin are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 30 cents per copy.

With stubble mulch, erosion from rainfall in some areas has been reduced to about 20 percent of that occurring from moldboard-plowed surfaces. Tests also indicate that various types and amounts of anchored crop residue can remove up to 99 percent of the wind's force at the soil surface.

Compared with moldboard tillage, stubble mulching in semi-arid regions has: Improved the soil from the standpoint of water-infiltration and tilth; Resulted in somewhat higher soil-moisture content; Tended to check the decline in organic-matter content of soils; Lowered soil nitrates slightly; Resulted in small yield increases of wheat; Reduced protein content of wheat by about .05 of 1 percent; Produced slightly less wheat straw, thus lowering the straw-to-grain ratio; Increased the weed problem in some instances;

Certain features of mulch tillage as conducted in the past have been found undesirable. One frequent malpractice is excessive working of the soil. Such over-tillage tends to destroy the residue cover, to pulverize the surface soil, and in general to nullify the benefits of stubble mulching.

Another mistake has been that of maintaining a constant depth of subsurface tillage, instead of varying the depth. This results in compacted soil immediately below sweep depth. Occasional use of a chisel-type implement to break up the compacted soil is recommended.

The report points out that stubble mulching needs further development in some areas. In the humid regions of the East and in some of the more humid western areas, the practice has cut yields and caused other problems. Soil scientists believe, however, that its advantages can offset its disadvantages. They are working to find the needed answers.

So far, the researchers are not sure why mulching frequently lowers crop yields in humid areas. They do know that it can result in a tie-up of nitrogen needed as plant food. Another difficulty is that more weeds may occur under stubble mulching. The practice also increases rate of water absorption by the soil. On heavy, slow-drying and slow-warming soils, undesirable soil conditions may be worsened by mulching.

These are some of the problems that research is facing, in order to perfect one of the most valuable techniques ever devised for better farming and more effective soil conservation in low-rainfall and high-wind areas.

National winners of 4-H Field Crops Awards for 1957 pose with Hugo Riemer, president of Nitrogen Division, Allied Chemical & Dye Corp. The awards, $400 scholarships, were made during 4-H Club Congress December 1-5. Nitrogen Division has been donor of Field Crops Awards on the county, state and national level for three years. Shown, left to right, are: Preston Cornelius, Troutman, N. C.; Paul E. Richardson, Jr., Huntington, Mass.; Clifford Orr, Ypsilanti, N. D.; Mr. Riemer; Jimmie Pierce, Minburn, Iowa; James M. Schlitz, Ponca City, Okla.; and J. Robert Paulson, Tracy, Calif.

Fertilising Problems In The Future

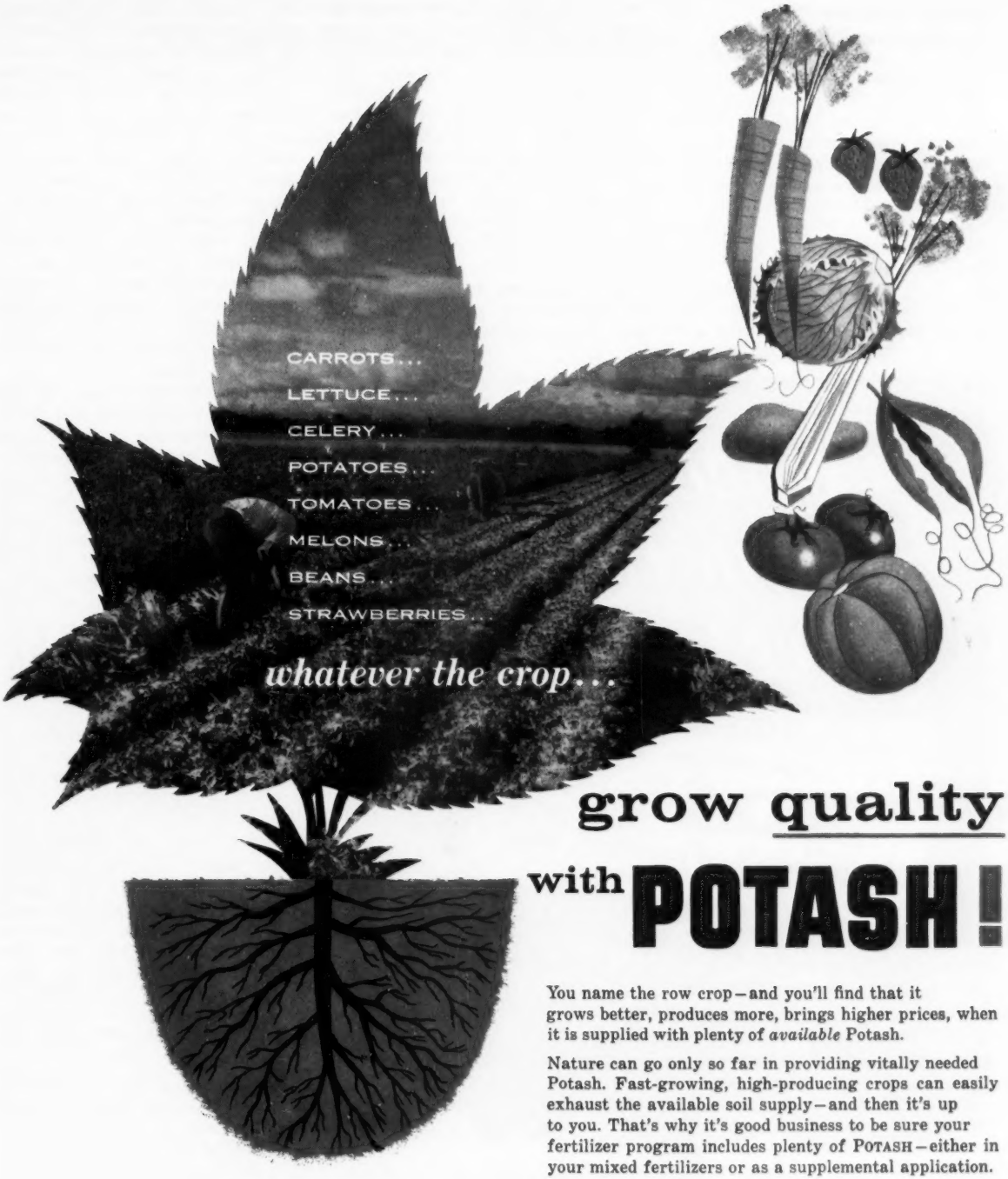
Consumption of commercial fertilisers increases, and many new fertilisers are offered on the market. It is an open question — important now, and in the future — if we use fertilisers in a proper way.

Easily soluble fertilisers increase the concentration of salts in the soil; the result may become deleterious to the plants. High-percentage fertilisers may diminish this risk, but in the long run such fertilisers may cause other difficulties; they lack, as a rule, other elements than the common macro-nutrients N, P, K; and their use may deplete the soil of the other vital elements. There is also a risk of fixing of phosphorous in the soil; we must remember that the supplies of phosphates are not inexhaustible in our world.

Fertilisers influence the quality of the crops. There is a great problem how to use commercial fertilisers in such a way that we do not spoil the quality of the crop in order to get a large quantity. The principal products of agriculture are used for food, therefore their quality should be good in all respects.

The most important problem, however, is how to retain a good content and quality of the soil humus, or even to make the humus condition better than now in many soils. Fertilising will become too expensive, or even practically useless, if the humus question be not handled in a proper way. The most urgent question is how to preserve soil fertility for coming generations.

(Professor K. A. Bondorff, Statens Planteavlslaboratorium, Lyngby, Denmark, in "Plant Nutrition News.")



grow quality with POTASH!

You name the row crop—and you'll find that it grows better, produces more, brings higher prices, when it is supplied with plenty of *available* Potash.

Nature can go only so far in providing vitally needed Potash. Fast-growing, high-producing crops can easily exhaust the available soil supply—and then it's up to you. That's why it's good business to be sure your fertilizer program includes plenty of POTASH—either in your mixed fertilizers or as a supplemental application.

American Potash & Chemical Corporation is a basic supplier of Potash. Consult your fertilizer dealer today and be sure to specify plenty of TRONA® POTASH, *the vitally needed plant food.*

American Potash & Chemical Corporation

TRONA

Producers of: BORAX • POTASH • SODA ASH • SALT CAKE • LITHIUM • BROMINE • CHLORATES • PERCHLORATES • MANGANESE DIOXIDE • *and a diversified line of specialized agricultural and refrigerant chemicals.*

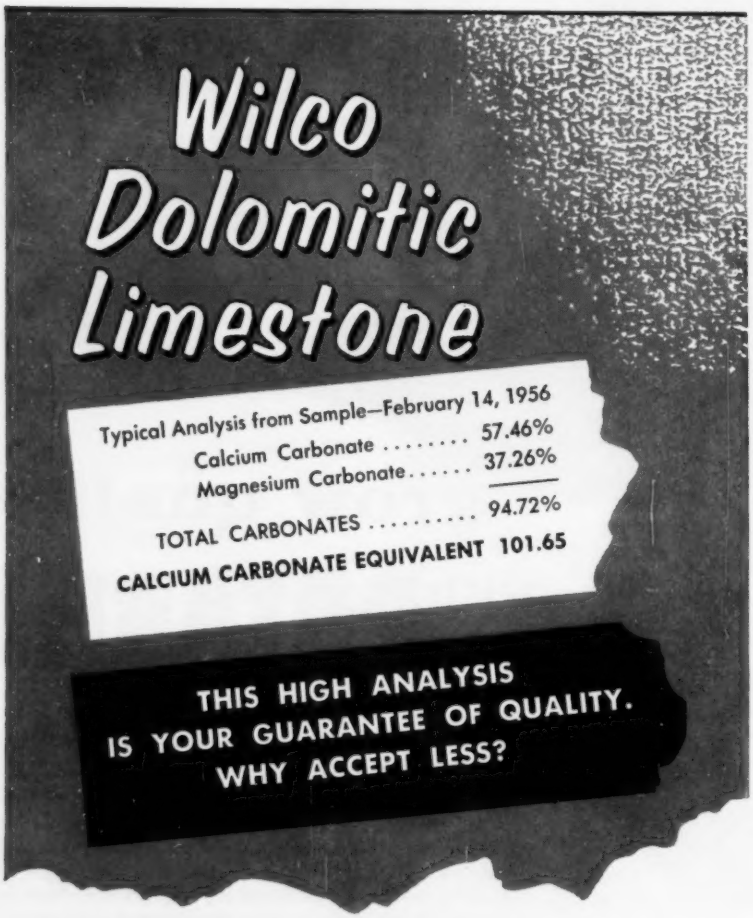
Offices • 3030 WEST SIXTH STREET, LOS ANGELES 54, CALIFORNIA
99 PARK AVENUE, NEW YORK 16, NEW YORK
235 MONTGOMERY STREET, SAN FRANCISCO 4, CALIFORNIA
1320 S.W. BROADWAY, PORTLAND 1, OREGON
214 WALTON BUILDING, ATLANTA 3, GEORGIA

Dorrco Systems In Western Plants

Two Western fertilizer producers recently announced decisions to install Dorrco FluoSolids Systems to calcine phosphate rock at new plants in Idaho and Wyoming. Presently under construction and scheduled to go into operation in 1958, the Georgetown, Idaho plant of Central Farmers Fertilizer Company will employ a fluidized system to handle 25 tons of phosphate rock per hour. Organic materials which interfere with processing steps later in the flowsheet will be burned off in this operation. As the result of extensive and successful field tests with a fluidized pilot plant, San Francisco Chemical Company has purchased a two-Reactor FluoSolids System to calcine 1000 tons per day of phosphate rock at their Leefe, Wyoming plant. Operating in parallel at 6300' elevation, each Reactor will be capable of roasting a maximum of 25 tons per hour of very abrasive and sticky feed material.

The FluoSolids Reactors at both locations will be divided vertically into three compartments by refractory arches. Feed material, essentially —¼" in size, is first admitted to the top, or preheating chamber, where it is heated by hot gasses rising from the calcining chamber beneath. Preheated rock overflows into the 14' diameter calcining chamber below and is calcined at about 1450°F. Fully calcined particles overflow into the lower or cooling chamber where they are cooled by the incoming air. Cooled product is taken off for further processing while the hot gasses, after rising countercurrently through the upper compartments, are passed through cyclones to remove fine entrained dust.

The Dorrco FluoSolids System, employing the fluidized bed principle, was originally applied to the roasting of arseno-pyrites in the recovery of gold and to the calcination of limestone. In the past several years, however, this System has been widely used for roasting of various sulfide minerals such as pyrite and zinc and copper concentrates and also for drying of various non-metallics and fine coal.



WILLINGHAM-LITTLE STONE COMPANY

DOLOMITIC WILCO LIMESTONE

Fulton Federal Building
Atlanta 3, Georgia
Phone JAckson 3-5591

serving the south's fertilizer industry for more than 42 years

Indian Plow Distributes Both Seed & Fertilizer

A simple suggestion by Roy L. Donahue, agronomist on the Kansas State College-ICA-India team could mean a 25 percent increase in India's production of wheat, grain sorghum, millet, and barley.

The Indian "desi" plow has two bamboo tubes and is used as a seeder and fertilizer distributor, with seed put in one tube and fertilizer in the other. However, both seed and fertilizer come out the same opening and with such placement no more than 20 pounds of nitrogen can be used without burning the seedlings.

Participating recently in the first fertilizer school in Madhya Pradesh, Donahue explained that ideal placement of fertilizer was two inches to one side and two inches below seed level. While no one knew of an implement designed to place fertilizer in this position, Indian workers achieved the desired results with only a minor adjustment to the desi plow.

Donahue now is helping state officials plan their first soil conservation and irrigation school. He writes he almost had to "fight" to get the idea approved to have five days of field training during the seven day school.

CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

	November		October		July-Sept. Qtr.		January-June		July-December		YEAR (July-June)	
STATE	1957	1956	1957	1956	1957	1956	1957	1956	1956	1955	1956-57	1955-56
Alabama	------	33,110[1]	53,326	53,799	76,674	73,433	808,900	872,550	174,707	165,867	983,607	1,042,416
Arkansas	------	7,485[1]	9,867	10,719	44,923	33,156	265,265	299,172	59,915	60,299	325,150	359,471
Georgia	78,061	88,232	45,797	31,456	100,432	84,808	980,824	988,454	253,559	250,968	1,234,383	1,244,422
Kentucky	------	6,444[1]	30,666	36,595	38,972	38,271	451,083	441,481	90,284	91,478	541,367	529,600
Louisiana	7,100	12,740	18,870	25,944	31,773	24,150	200,277	217,343	71,129	59,345	271,406	273,688
Missouri	------	32,870[1]	88,955	90,574	188,293	177,012	460,487	444,230	331,343	356,241	791,830	800,471
N. Carolina	------	43,644[1]	70,631	62,001	72,305	67,264	1,300,353	1,324,267	216,234	225,182	1,516,587	1,649,449
Oklahoma	1,965	6,489	17,213	20,384	29,832	25,166	52,836	65,854	54,509	69,542	107,345	135,396
S. Carolina	19,906	24,993	28,212	31,707	48.486	43,019	694,571	743,670	122,929	119,947	817,500	863,617
Tennessee	30,036	36,476	30,250	38,202	69,431	58,205	383,457	378,626	165,796	154,260	549,253	532,886
Texas	20,452	44,411	50,088	54,822	109,118	71,437	392,770	372,695	202,406	193,704	595,176	566,399
California	(reports compiled quarterly)				216,479	181,386	663,484	639,377	412,747	361,615	1,079,748	1,001,554
Virginia	(reports compiled quarterly)				74,379	75,566	600,158	599,111	154,075	162,709	754,223	761,820
Indiana	(reports compiled semi-annually)						781,268	807,981	305,917	255,131	1,087,185	1,063,049
Iowa	(reports compiled semi-annually)						------	315,329[1]	85,147	130,000	------	445,329[1]
Michigan	(reports compiled semi-annually)						------	443,908[1]	184,763[1]	*	------	*
New Hampshire	(reports compiled semi-annually)						15,730	13,168	3,253[1]	*	18,983[1]	*
Washington	(reports compiled semi-annually)						------	103,885[1]	55,709	48,749	------	152,674[1]
Connecticut	(report issued annually)										------	76,660[1]
Oregon	(report issued annually)								62,147[1]	*	------	*
TOTAL	157,520	213,341	423,875	456,203	1,101,097	952,873	8,051,463	8,207,979	2,756,406	2,705,037	10,654,760	10,824,238

------(not yet reported) * Not compiled [1] Omitted from column total to allow comparison with some period of current year.

MARKETS

ORGANICS: Demand and supply of fertilizer organics appear to be in good balance with producers of Nitrogenous Tankage in comfortably sold position at prices ranging from $3.00 to $4.00 per unit of Ammonia through December and $3.12½ to $4.25 for January/forward shipment, depending on location of the producer.

SEWAGE SLUDGE: One Midwestern material is unchanged at $3.10 per unit of Ammonia and 50¢ per unit of APA, bulk, f.o.b., and a Southwestern material at $2.75 per unit of Nitrogen and 50¢ per unit of APA, f.o.b.

CASTOR POMACE: Domestic production continues on a limited scale and published price is $45.50 per ton in bags f.o.b. Eastern seaboard production, for shipment prompt through March.

DRIED BLOOD: Unground, sacked Blood is indicated at $5.50 to $5.75 per unit of Ammonia f.o.b. Chicago area, whereas, in the New York area, the price range is $4.50 to $4.75. Use is primarily for feed purposes.

POTASH: No unusual activity is noticed in this material and movement is in seasonal dimensions. Prices remain firm and unchanged from previously announced schedules.

GROUND COTTON BUR ASH: Supply and demand for this form of Potash, primarily in the form of Carbonate of Potash, continues in even balance and prices steady at levels approximating the delivered cost of Sulphate of Potash for most areas.

SUPERPHOSPHATE: Movement is beginning to accelerate as mixers throughout the Southeast and elsewhere prepare for the coming season. Prices of normal grade Superphosphate continue steady and in most cases unchanged. No change is noted also for Triple Superphosphate.

CALCIUM AMMONIUM NITRATE: Demand continues seasonal and stocks are being built up in anticipation of the usual heavy movement that begins shortly after the first of the year. Price is unchanged at $49.75 per ton in bags, or $45.75 in bulk, f.o.b. Middle Atlantic plant and f.o.b. cars Atlantic and Gulf ports.

AMMONIUM NITRATE: Production continues at a good rate, but demand is seasonal and expanding. Effective January 1st most producers will have a price of $72.00 per ton in bags, f.o.b. shipping point. It is reported one producer at least is indicating a price of $70.00.

GENERAL: In the last few weeks inventories of raw materials and mixed fertilizers have expanded, preparatory to demand for the coming season. The extreme cold weather in the last few days in the Southeast has caused considerable damage to vegetable, citrus and other late fall crops, particularly in the Florida area, which undoubtedly will have some effect on the manufacturing plans of fertilizer manufacturers.

Fertilize Ocean For More Food?

Add iron to salt water, and we might be able to grow food for the rapidly multiplying human family. This was a "might be" supplied by Dr. S. Granick of the Rockefeller Institute during a three-day conference on trace elements at the Ohio AES, sponsored by the Kettering Foundation. With increasing population, fresh water will become a limited resource, in which event an agriculture based on ocean water may have to be developed, he said.

INDUSTRY CALENDAR

Date	Organization	Place	City
Jan. 7-8	Texas Fert. Conf.	Memorial Center	College Station
Jan. 30	Fert. Safety Exec. Comm.		Washington, D.C.
Feb. 13-14	MidWest Soil Impr.	Edgewater Beach	Chicago, Ill.
June 9-11	Sou. Control Officials	Heart'Atlanta Motel	Atlanta, Ga.
June 12	Fert. Safety Exec. Comm.	Hotel Roanoke	Roanoke, Va.
June 15-18	NPFI	The Greenbrier	White Sulphur
July 8-10	Pac. N.W. Fert. Conf.		Pocatello, Idaho
July 16-19	S.W. Fert. Conf.	Buccaneer Hotel	Galveston, Texas

Personals

AAC ANNOUNCES 5 PERSONNEL CHANGES

American Agricultural Chemical has listed five personnel changes: Joseph Padar, to chief chemist, chemical control lab at Danville; J. W. Grooms, from Savannah sales office to assistant manager, fertilizer sales, Greensboro, N. C.; R. T. Gravitte, from Alexandria, Va. sales office to assistant manager of sales, Cincinnati fertilizer plant; R. T. McFerson to assistant manager of sales, Fulton, Ill., fertilizer plant; W. A. Glover, from assistant super at Pensacola to production super at the Columbia, S. C., fertilizer plant.

CHASE BAG'S CONNORS RETIRES

Robert N. Connors, after 35 years, has retired as executive vice-president of Chase Bag. He joined Northern Bag, which merged with Chase in 1925, as a salesman in 1922—and moved up steadily to the post from which he has now retired. He will continue as a member of their board of directors, on which he has served since 1939.

FEDERAL CHEMICAL ELECTS TOP BRASS

Federal Chemical Co., Louisville, Ky., announces the election of John V. Collis as board chairman, Jefferson D. Stewart, Jr., as president.

MONSANTO NEWS AFFECTS 6

Bobby E. Ford, who joined Monsanto in New Orleans in 1956, has been shifted to Atlanta as assistant general manager of the sales division office there. Four promotions are reported from their Barton Plant, Luling, La.: H. L. Payton to plant manager, replacing R. L. VanZandt who is on sick leave; F. B. Elliott to production superintendent; J. W. Gillespie to maintenance superintendent; D. E. Cayard as maintenance supervisor. Channing W. Godbald has joined the engineering department of their inorganic chemicals division at St. Louis. He was formerly project engineer for Atlas Powder.

COTTON'S WELCH "MAN OF THE YEAR"

Calude L. Welch, head of the National Cotton Council's production and marketing division has been named by Progressive Farmer magazine as man of the year in service to Southern agriculture, for notable service in the field of cotton production and marketing.

HANFORD RESEARCH VP FOR OLIN MATHIESON

Dr. W. E. Hanford, who joined them last July, has been appointed vice-president for research by Olin Mathieson. He has been assistant to the president for research.

A. T. Montgomery, who is covering Alabama out of Atlanta for Commercial Solvents, calling on fertilizer manufacturers.

Harold W. Lloyd, who has joined Commercial Solvents as sales representative, covering North Carolina out of Atlanta.

SPENCER ASSIGNS CASTAGNO AND LORTSCHER

Spencer Chemical has announced the assignment of Paul Castagno and Larry Lortscher as technical service representatives for crop chemicals. Mr. Castagno will work in the Midwest; Mr. Lortscher will service Northern national accounts working out of Columbus, O.

T. W. Brown, Jr., general salesmanager of the multiwall bag division of Owens-Illinois Glass.

NITROGEN DIVISION UPS GREGORY

J. S. Gregory, who has been control chemist at Nitrogen Division's South Point plant has now been promoted to the post of superintendent of shipping. He joined them at Hopewell in 1942.

HADEN IS GM OF V-C DIVISION

Russell L. Haden, Jr. has been named by Virginia-Carolina to succeed Edwin Cox who last September retired as vice-president and general manager of the organic chemicals division.

DAVISON PROMOTES GOODALL, DEVINNY

Robert D. Goodall and H. B. DeVinny have been named Davison Chemical vice-presidents. Mr. Goodall becomes general manager of the chemicals division, succeeding F. C. Nicholson who is to assume increased responsibilities in connection with major development projects of W. R. Grace & Co. in the international field.

Phillip Williams, named asistant multiwall sales manager, Owens-Illinois Glass.

Mr. DeVinny continues the responsibilities he had as director of industrial and public relations. Mr. Goodall joined them in 1939; Mr. DeVinny has been with them since 1941.

JACK WORKMAN RESIGNS FROM V-C

C. E. "Jack" Workman, who has been with Virginia-Carolina for 21 years and has been field salesmanager of their fertilizer division, resigned effective December 31.

COTTON'S CHANCE GETS FEDERATION HONOR

President George G. Chance of the National Cotton Council was one of three Americans honored last month by the American Farm

Frank B. Stewart who has become general manager and executive vice-president of Miller Products Co., Portland, Ore. Roy E. Miller remains as president and board chairman.

Bureau Federation. His citation was for distinguished and meritorious service to US Agriculture.

FISK, CHAIRMAN ALLIED CHEMICAL

Effective the first of this month, Kerby H. Fisk became board chairman of Allied Chemical & Dye. He succeeds Fred J. Emmerich, who retires after 37 years with the company, but who will continue as a

Sylvester Grant, Jr. promoted to the post of technical service representative, Sohio Chemical, assisting H. H. Tucker.

director. To the newly created posts of executive vice-president, were elected Carlton Bates and Harry S. Ferguson. Chester M. Brown was elected vice-president.

KLAUS S-M AT RAVEL BROTHERS

Erwin H. Klaus, who had been marketing director of Northrup, King & Co. has become salesmanager of Ravel Brothers, Inc., farm and garden supplies distributors at Albuquerque, New Mexico. An active writer, Mr. Klaus is associate editor of Western Feed and Seed magazine and has just been made a member of the Sales Management magazine's sales leadership panel. He has served as US delegate to the UN economic, scientific and cultural

J. C. Bauman, who has been made Western district manager of Multiwall bag sales for Union Bag-Camp Paper. He has been with them since 1950.

organization, and is now chairman of the UN American veterans committee.

2 NEW DIRECTORS AT SMITH-DOUGLASS

At the recent annual meeting of Smith-Douglass Co., Inc., two new board members were elected: Bliss Ansnes, lawyer, and John L. Gibbons, executive vice-president of

Jefferson D. Stewart who has been elected president of Federal Chemical. John V. Collis has become board chairman.

Chemical Corn Exchange Bank. Board chairman, Ralph B. Douglass made the announcement.

WADLEIGH JOINS STAUFFER SALES

Weldon L. Wadleigh has joined Stauffer Chemical as a salesman for the agricultural division in the mid-West, covering Illinois and Indiana.

NITROGEN DIVISION UPS HARRY MYERS

Harry E. Myers has been promoted from senior chemist to assistant control chemist at Nitrogen Division's South Point plant. He joined the Allied Chemical and Dye Division in 1951.

changes

Swift & Co. has changed the name of its **Plant Food Division** to the **Agricultural Chemical Division,** we learn from general manager **W. F. Price** at the same time its Chicago organization has been realigned along product and functional lines. **T. L. Adcock,** formerly Northern marketing manager, becomes marketing chief for all products. **W. J. Chapin,** formerly Southern marketing manager, is in charge of agricultural plant food marketing; while **E. E. Randolph** becomes head of garden products marketing and **G. E. Bruington** retains responsibility for pesticides marketing.

In other changes, **M. D. Sanders,** formerly director of research, becomes director of research & development; and **A. H. Bowers,** formerly agronomist, assumes responsibility of merchandising and technical service for all products of the division. The manufacturing department, under **U. C. Ellis,** general superintendent, becomes the production dept.; and **B. W. Guess** remains in charge of purchasing as head of the procurement department, formerly the raw materials department.

* * *

Richardson Scale Co. another district office change: The New York-New Jersey area district office has been moved into the company's main office, for which space was provided when they opened the Clifton N. J. headquarters at 66 Van Houten Ave.

Simultaneous with this move, **R. W. Bagnell** has been made manager of the district. He has been with them since 1949.

* * *

Pacific Supply Co-operatives has changed its name to **Pacific Co-operatives** and has adopted a new trade-mark, a large blue "P" set in eccentric red and white circles.

* * *

Phillips Chemical Company, Bartlesville, Okla., has announced the incorporation in Mexico, D. F., of its subsidiary, **Phillips Quimica S. A. de C. V.,** to supply Phillips 66 chemical fertilizers to Mexican agriculture. Administrator of Phillips Quimica operations is **H. C. Jordan,** now living in Mexico, D. F.

Plans call for the use of numerous regional warehouses, strategically located, from which the various fertilizers will be distributed to customers throughout Mexico.

Home Gardeners Increase Use Of Garden Pest Control Chemicals In 1957

Farmers used about the same volume of pesticide chemicals in 1957 as in 1956 while volumes of these chemicals used by home gardeners and others increased slightly during the year, the National Agricultural Chemicals Association reported.

The NAC Association represents some 135 manufacturers and formulators of pest control chemicals used in farming, home gardening and lawn care, park and forest maintenance, highway roadside maintenance, and in public health programs designed to eradicate disease-carrying insects and rodents.

Total sales of basic pesticide chemicals are estimated at 250 million for 1957. This is equal to the record high sales attained in 1956. Approximately 60 percent of the industry's sales are to farmers, 20 percent to non-farm users (including home gardeners), and 20 percent are in exports.

Major market developments for the industry during the year were:

1) Growing interest of foresters in using chemicals in forest conservation. Forest insects and diseases are now killing nine times as much timber as forest fire, causing a critical problem both for the $20 billion forest products industry and for forest conservationists.

2) Wider use of chemical insect, plant disease and weed control in home gardening and lawn care bolstered by expanding suburbs and increased leisure time for gardening.

3) A steady growth in exports, particularly to underdeveloped areas of Asia and Africa where improved pest control is the key to increasing food production and to improving public health through control of disease-carrying mosquitoes, fleas, and rats.

4) Growing importance of aerial application of pesticide chemicals in agriculture and in forest maintenance. More than 7,500 airplanes flew an estimated 1,000,000 hours in aerial application in 1957 compared with 700,000 hours flown for this purpose in 1951.

5) Small but steady increases in the relatively new uses of pesticide chemicals to a) protect elm trees against damage from Dutch elm disease, b) control brush, weeds and noxious plants along highway roadsides, and c) protection of park visitors through control of tormenting insects and injurious plants such as poison ivy in public parks.

Triangle Brand Copper Sulphate has been recognized as an effective agricultural chemical for more than sixty years. In sprays (where Bordeaux mixtures are the most reliable), **in dusts (if you prefer them)** and in fertilizers (for additional enrichment of the soil) Triangle Brand Copper Sulphate has proved itself worthy and dependable. Try these Triangle Brand forms of Copper Sulphates:

INSTANT (powder) for quick and efficient mixing or Bordeaux sprays.

SUPERFINE (snow), SMALL or LARGE CRYSTALS, all containing 25.2% metallic copper.

BASIC Copper Sulphate in powder form, containing 53% metallic copper.

Write for booklets that will help you solve your agricultural problems.

Control POND SCUM and ALGAE with Triangle Brand Copper Sulphate. Write today for information on how it can help you maintain healthy water conditions.

PHELPS DODGE REFINING CORP.
300 PARK AVE., NEW YORK 22, N.Y. • 5310 W. 66th STREET, CHICAGO 38, ILL.

PHELPS DODGE REFINING CORPORATION — NICHOLS — TRIANGLE BRAND — CHEMICALS — NEW YORK, N.Y.

Bird Tax Brings Pesticide Screams

The Audubon Society, which worries about birds, has proposed a tax on crop chemicals with which to finance research on protection of their feathered friends. This is not likely to develop, but the industry is naturally in hot denunciation about it.

California Study On Plant Food Needs

The California Farm Bureau Federation is conducting a survey, the results of which will be announced at the end of the year, and which may make a lot of difference in production capacity planning for that area. 64,000 farm families are being queried about their future farm plans and fertilizer needs.

The Federation's members are said to produce the great bulk of the State's commercial crops, and it is believed that a report showing need for more than present fertilizer facilities would result in a cooperative, rather than encouragement to private enterprise.

Joint Sponsors Hold Short Course

Early last month Abraham Baldwin Agricultural College, the Georgia Coastal Plain Experiment Station and the Georgia Plant Food Educational Society jointly sponsored a short course on the campus at Tifton, Georgia, for fertilizer men. With Dean Cordell presiding, the program ran from 9:30 A.M. to 3 P.M. and the time between was solidly packed with information. The College president, George Donaldson, brought greetings. W. H. Appleton of the GaPFES set the stage with "Why We Have Met Here." The Federal Reserve Bank sent Arthur Kanter to discuss the outlook for agriculture. The State Department of Agriculture sent its head man, Paul Jolly, to relate their activities to the fertilizer industry.

After lunch Dr. R. L. Wehunt, associate agronomist, University of Georgia extension, spoke on Georgia's intensified soil fertilization program. R. L. Carter, soil scientist from the Coastal Plain AES spoke on soil testing. A panel laid out the Coastal Plain AES recommendations for various crops. And finally Dr. J. Fielding Reed, GaPFES secretary, conducted a question and answer period.

The new Georgia AES folder on Nitrogen was distributed, containing the latest recommendations aiming at an increase in nitrogen consumption in Georgia to 175,000 tons by 1965 instead of the present 42,000 tons and working toward the ideal of 223,000 annual tons.

42-Year Service From a Cotton Bag

At the Missouri Farmers Exchange, someone unearthed the fact that a bag, manufactured 42 years ago by Bemis Bro. Bag Co., is still in use, though its original purchaser, back in 1915 is now out of business. Such bags go through the exchange office on an average of 5 times a year—which means some 420 trips since this bag was put into service.

Silo to Heat Future Farm Homes

An enterprising reporter recently went to Dr. David S. Weaver, head of the North Carolina AES and asked him to rub his crystal ball. Dr. Weaver is one who, thirty years ago, was laughed at when he predicted the vanishing of the mule from Southern farms.

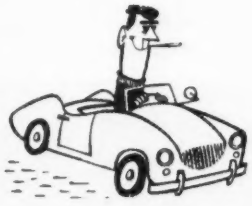
Now the good doctor is anticipating silos producing gas to heat the farm home; even to run the tractor. This is just one of Dr. Weaver's predictions. The rest seem equally fantastic. But this time nobody laughs.

TVA Answers Queries With New Pamphlet

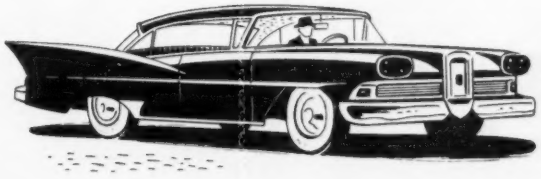
To answer the numerous questions it gets, TVA has prepared a pamphlet which covers many phases of its experimental fertilizer program. This is entitled "Fertilizer Science and the American Farmer."

Good Taste In Castor Oil

Though you may think of castor beans as the source of the nasty taste of your childhood, they may turn out to be in very good taste, and good medicine for cotton farmers with allotment problems. This ingenious theory was generated by the Kings County, California, farm advisor, O. O. McCutcheon. They grow well on alkali-free soils, and modern harvesting equipment contributes to the profit possibilities in this crop, he says.



NO MATTER WHAT SIZE OPERATION YOU HAVE . . .



THERE'S A **BLUE VALLEY** GRANULATION UNIT ENGINEERED FOR YOUR PLANT!

Blue Valley units incorporate economy and operating flexibility along with the capacity and quality production you desire. So, when considering granulation, think first of Blue Valley . . . the company with more units operating than any other. Write, wire, or call . . .

BLUE V

BLUE VALLEY EQUIPMENT MFG. AND ENGINEERING CO.

LAURENT & N. TAYLOR
TOPEKA, KANSAS
PHONE CEntral 4-3441

CALIFORNIA CONFERENCE

The Sixth Annual California Fertilizer Conference will be held on April 13, 14 and 15, on the campus of California State Polytechnic College, San Luis Obispo. 300 are expected to attend, according to J. H. Nelson and Earl R. Mog, both of Stockton, co-Chairmen of the Conference.

Sponsored by the Soil Improvement Committee, California Fertilizer Association, this annual conference provides a forum for dissemination of the latest information concerning fertilizer research. Among those who will attend are growers of all principal commodities; commercial laboratory personnel; cannery and other agricultural processing field men and technicians; research and extension personnel of the University of California, California State Polytechnic College and the State Colleges; the USDA Soil Conservation Service, and key representatives of the fertilizer industry.

The program will be general in its scope of coverage, but will lean somewhat toward range fertilization, because of the excellent work in that field going forward at Cal-Poly, according to the Committee, which urges livestock ranchers and all others concerned with profitable range management to be in attendance. No registration fee will be charged.

On Sunday evening, April 13, the Soil Improvement Committee will sponsor its annual joint dinner with the University of California Fertilizer Committee. Dr. Louis Proebsting of the Department of Pomology, Davis, is Chairman of the University Committee, and M. E. McCollam, Western Manager, American Potash Institute, Inc., San Jose, is Soil Improvement Committee Chairman. Current problems and newly developed research techniques are discussed at these annual affairs to mutual advantage.

The entire group will meet at 9 AM on Monday, April 14, in Engineering Auditorium for a morning program of formal papers on fertilizer use, given by recognized authorities in their fields.

Buses will transport all delegates on a tour of field-size range fertilization test plots in the area during Monday afternoon, with a luncheon stop at the first ranch for charcoal broiled steaks, barbecued beans, coffee, etc.

The Annual Conference Banquet, featuring an outstanding speaker will be held that evening in the Edna Farm Center Hall, on the southern outskirts of San Luis Obispo.

Two panels will be featured on Tuesday morning, April 15, one on "Range Fertilization," and the other on "Crop Response to Sulfur in California." The audience will be divided, half meeting in Engineering Auditorium, and the balance in Classroom 6, immediately across the street. The panels will rotate.

All growers and others interested in soil fertility and plant nutrition are invited. Further information, including programs when they have been printed, can be had upon application to the California Fertilizer Association, 475 Huntington Drive, San Marino 9, California.

CFA says the average California farmer is slightly over 50 years old and farms 307.1 acres (Editor's note —pretty good for an old guy!) The average value of his farm is $225 per acre, and he has $60,000 invested in land and buildings.

1. 34th Annual Convention California Fertilizer Association, St. Francis Hotel, San Francisco, November 4, 1957.
2. General Manager Sidney H. Bierly; 1957 President Jack Baker; Honorable True D. Morse, Under Secretary of Agriculture; and 1958 President, William G. Hewitt.
3. Panel on "Our Partnership With Agriculture": J. Earl Coke; Dr. George B. Alcorn; Moderator Dr. D. G. Aldrich, Jr.; John Martin, Jr. and Lowell M. Berry.
4. Dr. Russell Coleman, Exec. Vice President, National Plant Food Institute, and 1957 CFA President, Jack Baker.
5. Millard E. McCollam, Chairman, CFA Soil Improvement Committee.

Illinois Conference For Fertilizer Men

On January 21-22 a Fertilizer Industry Conference for manufacturers and distributors will be held at the University of Illinois, Urbana. Agronomy staff members will report on the latest in soil management and fertility research.

Florida Leads In Mixed Fertilizer Use

Florida is the first state in the US in the use of mixed fertilizer per acre, and second in total tonnage used, according to Dr. W. L. Pritchett of Florida AES. 40% of the tonnage was used by 5 central-Florida counties — Polk, Lake, Orange, Hillsborough and Dade. Florida's annual fertilizer bill is estimated at $60,000,000. Home-owners, incidentally, buy some 13% of the total tonnage, for lawns and ornamentals. But citrus and vegetables account for the bulk of the business.

Flower Growers Make Annual "Model" Changes

Flower growers—especially such as chrysanthemum people — make more model changes than the auto makers do. Mums, for example may show as many as 16 to 20 new varieties each year. Some are the result of careful hybridization; others are freaks that are carefully nurtured into established varieties over a 3-year period.

Growing methods are highly mechanized, even to running liquid fertilizer through pipes. When a section of greenhouse needs plant food—a valve releases it on the spot where needed.

New Airmerge Blending System In Fuller Bulletin

The Airmerge System, a new means of blending pulverized materials in a silo through quadrant aeration, is described in a four-page, two-color bulletin now available from Fuller Company, Catasauqua, Pa.

Divided into three sections, the bulletin discusses a typical Airmerge installation, the development of Airmerge, and principles of Airmerge blending. An isometric drawing shows how dry materials are homogenized by combining quadrant blending and pulsated aeration.

Four photographs illustrate a typical installation. Two diagrams show the blending tolerances of mixed materials.

For copies of Bulletin B-1, write to Fuller Company, Catasauqua, Pa.

J. I. Case offers this all new Terraload'r, 4-wheel drive, rear wheel steer, tractor loader in the 1-3/4 cubic yard class. It is the first of a series they plan to offer. For full details, ask for W-9 data from J. I. Case Co., Racine, Wisc.

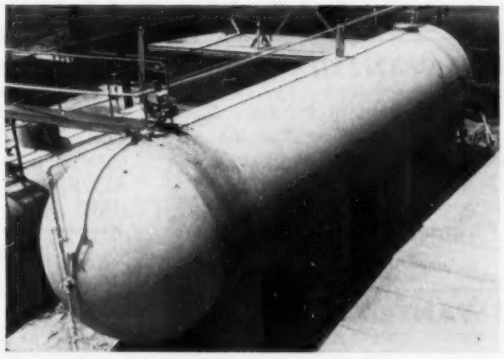
Bankers Film Dramatizes Farming

The ways bankers can help farmers have been dramatically put into a film — "Banking on Farmers" which is being distributed by the American Bankers Association and is available only through local banks and state bank associations.

Something new has been added to the modern scene at Cornell's New York State Agricultural Experiment Station at Geneva, a unit of the State University.

They are inaugurating an "Apple Break" in place of the now familiar Coffee Break.

Each day a different apple variety will be displayed including not only standard varieties, but new introductions from the Station's fruit breeding program and even old varieties no longer grown commercially.



FIRST with Aluminum Tanks for Nitrate Solutions

• COLE was first to build welded aluminum tanks for nitrate solutions, just as we have always pioneered in supplying the plant food industry with tanks or equipment for the storage or processing of agricultural chemicals. . . . Send us your inquiries for conventional or special design tanks—shop built up or field erected, using flat, flanged and dished, or hemispherical heads. Write for a copy of *Tanks and Equipment for the Plant Food Industry.*

R. D. COLE MANUFACTURING CO. COLE NEWNAN, GEORGIA

Elevated Tanks, Pressure Vessels, Chemical and Processing Equipment from Aluminum, Stainless and Carbon Steel, Monel and Other Alloys.

Established 1854

R. D. COLE MANUFACTURING CO.
NEWNAN, GEORGIA

-ADVERTISING INDEX-

Allied Chemical & Dye Corp., Nitrogen Div. ..... Front Cover, 19-22
American Agricultural Chemical Company, The .....
American Cyanamid Co., Phosphates Department 13
American Limestone Co. .....
American Potash & Chemical Corporation 49
Armour Fertilizer Works .....
Ashcraft-Wilkinson Co. 12, 26
Atlanta Utility Works 14

B.I.F. Industries, Inc., Omega Machine Co. Div. .....
Bagpak Division, International Paper Co. .....
Berkshire Chemicals, Inc. 14
Blaw-Knox Company, Blaw-Knox Equipment Division .....
Blaw-Knox Company, Chemical Plants Division .....
Blue Valley Equipment Mfg. & Engineering Co. 55
Bradley & Baker .....
Burlap Council of Indian Jute Mills Assn. .....

Chase Bag Company .....
Cole Manufacturing Co., R. D. 57
Commercial Solvents Corporation 16
Continental Gin Co., Industrial Div. .....

Davidson-Kennedy Associates Co. .....
Davidson-Kennedy Co. .....
Davison Chemical Co., Div. W. R. Grace & Co. .....
Dow Chemical Company, The .....
du Pont De Nemours & Co. (Inc.), E. I. 8
Duval Sulphur and Potash Co. 26

Fertilizer Equipment Sales Corporation 58
Fulton Bag & Cotton Mills .....

Grand River Chemical Division, Deere & Company .....

International Minerals & Chemical Corporation
Phosphate Chemicals Division 6-7
Phosphate Minerals Division 23
Potash Division 9
International Paper Company .....

Kraft Bag Corporation ..... Inside Front Cover

Law & Company 14
Longhorn Construction Co. 12
Lummus Company, The .....

Marietta Concrete Corporation, The .....
McIver & Son, Alex M. 14

National Lime and Stone Co., The 12
National Potash Company 43
Nitroform Agricultural Chemicals, Inc. .....
Nordberg Manufacturing Company .....

Omega Machine Company, Div. B.I.F. Industries, Inc. .....

Phelps Dodge Refining Corporation 54
Phillips Chemical Company .....
Potash Company of America ..... Inside Back Cover

Quaker Oats Company, The (Chemicals Dept.) 14

Raymond Bag Corporation 18
Renneburg & Sons Co., Edw. .....

Sackett and Sons Co., The A. J. 40, 41
St. Regis Paper Company, Multiwall Bag Division .....
Shuey & Co., Inc. 58
Sinclair Chemicals, Inc. .....
Smith-Rowland Company 3
Sohio Chemical Company .....
Southern Nitrogen Company, Inc. 34, 35
Southwest Potash Corporation 30
Spencer Chemical Company 45
Stedman Foundry & Machine Company, Inc. .....

Tennessee Corporation 38
Texas Company, The Petrochemical Sales Division 15
Texas Gulf Sulphur Co. .....
Tull Metal & Supply Co., Inc., J. M. 10

Union Bag-Camp Paper Corporation 17
Union Special Machine Co. ..... Back Cover
U. S. Industrial Chemicals Co., Division of National Distillers & Chemical Corporation 4
U. S. Phosphoric Products Division, Tennessee Corp. 4
United States Potash Company, Div. United States Borax & Chemical Cirp. 11
United States Steel Corporation .....

Weatherly Company, The D. M. .....
Wiley & Company, Inc. 14
Willingham-Little Stone Company 50
Woodwrad & Dickerson, Inc. 50

CLASSIFIED ADVERTISING

SITUATION WANTED

WANTED: Position as superintendent of fertilizer factory. 20 years experience, thoroughly experienced in the manufacture of sulphuric acid, superphosphate and commercial fertilizer. Presently employed as superintendent of factory. Have very good reason for change. Box 32, c/o Commercial Fertilizer, 75 - 3rd St., N. W. Atlanta, Ga.

HELP WANTED

WANTED: Experienced fertilizer man capable of handling fertilizer operation; no selling. State past experience and salary expected. Farmers Cotton Oil Co., Wilson, N. C.

EQUIPMENT FOR SALE

FOR SALE: Beaird Dryers 4 x 30'. Dewatering Presses, Louisville 8 Roll 36"; Davenport #1A, #2A. Ribbon Mixers 336 cu. ft. Gemco 6' dia. Conical Blender. Rotary Steam Tube Dryers 6' x 45', 4' x 30'. Steel Tanks 4,000 to 9,400 gal. Also Pulverizers, Conveyor, etc. Perry Equipment Corp., 1426 N. 6th St., Philadelphia 22, Pa.

FOR SALE: Rotary Dryers 5' x 30', 6' x 30', 7' x 30', 6' x 50', 3 Louisville 6' x 50' Rotary Steam Tube Dryers. Also Mixers, Storage Tanks, Screens, Elevators. Send us your inquiries. BRILL EQUIPMENT COMPANY, 2401 - 3rd Ave., New York 51, N. Y.

For Sale, Exchange and Wanted Advertisements, same type now used, EIGHT CENTS a word for one insertion; TWELVE CENTS a word for two insertions; FIFTEEN CENTS a word for three insertions, and FOUR CENTS a word for each insertion more than three; ADVERTISEMENTS FOR THIS COLUMN MUST BE PAID IN ADVANCE.

SHUEY & COMPANY, INC.

Specialty: Analysis of Fertilizer Materials and Phosphate Rock. Official Chemists for Florida Hard Rock Phosphate Export Association. Official Weigher and Sampler for the National Cottonseed Products Association at Savannah; also Official Chemist for National Cottonseed Products Association.

115 E. Bay Street, Savannah, Ga.

Serving the

FERTILIZER INDUSTRY

Fertilizer Equipment Sales Corp.

Designers — Engineers — Manufacturers of Fertilizer Machinery

Sales and engineering office:
P. O. Box 1968
130 Krog St., N. E.
Atlanta, Ga.
Phone JAckson 3-6615

Manufacturing plant:
P. O. Box 67
1641 Poland St.
New Orleans, La.
Phone Bywater 8373

GIANT SERVANT OF AGRICULTURE

Use the Best!

Our pioneering in Potash Granulation enables us to offer the BEST 60% Granular Muriate available.

New 60% Standard Muriate

New 60% Special Granular Muriate

New 60% Coarse Granular Muriate

Sulphate of Potash

Chemical Muriate — 99.9% KCL minimum

Quick Service — High Quality
Phone, write, telex, or wire us.
Phone STerling 3-4990, Washington
TWX No. - WA-331

POTASH COMPANY OF AMERICA

CARLSBAD, NEW MEXICO.

General Sales Office . . . 1625 Eye Street, N.W., Washington, D.C.
Midwestern Sales Office . . . First National Bank Bldg., Peoria, Ill.
Southern Sales Office . . . Candler Building, Atlanta, Ga.

PLAIN SEWED CLOSURE

The simplest and most popular sewed closure for textile, paper-lined textile and paper bags of all sizes.

FOLDED TOP CLOSURE

An excellent plain sewed closure for multiwall paper bags. Bag top is folded over and sewed through to form a strong, neat closure.

TAPE-BOUND CLOSURE

Multiwall paper bags closed with tape-bound closures add to package sales appeal and provide a bag that can be handled without fear of closure breaks.

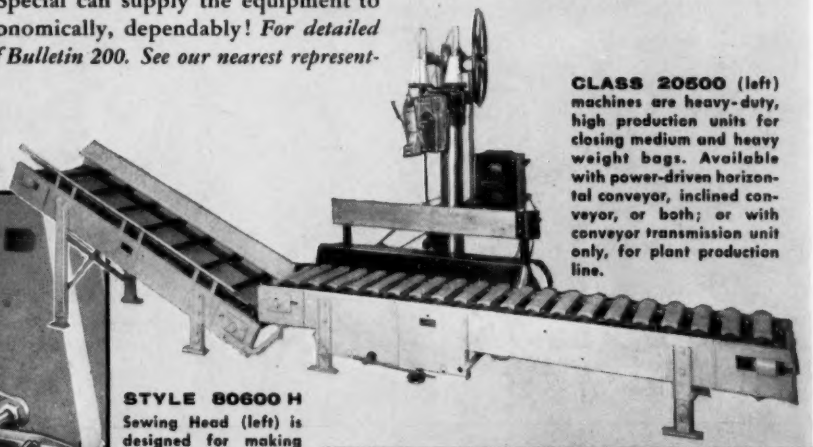
A Guide to LOWER PACKING COSTS! BETTER BAG CLOSURES!

If you're interested in bringing packing costs down, here is the way to do it. Take advantage of Union Special's wide knowledge of bag closing and its problems. By selecting your equipment from Union Special's complete line you can get the correct equipment for your particular job — equipment that will do it better, faster and cheaper, giving you a stronger closure at lower cost.

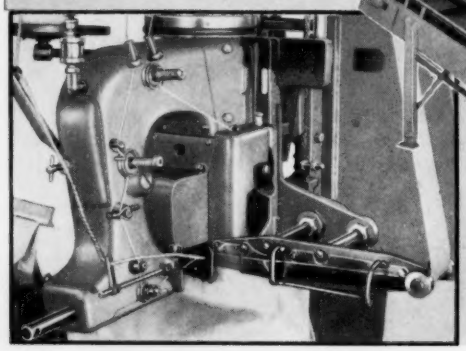
In the Union Special line you will find machines for closing all sizes and kinds of bags from small textile or paper bags up to the largest multiwall paper bags in use today. Whether your production schedule calls for closing just a few bags or for high continuous output, Union Special can supply the equipment to do the work efficiently, economically, dependably! *For detailed information, ask for a copy of Bulletin 200. See our nearest representative or write today.*

NEW BULLETIN 200

Just off the press — 16 pages of information on equipment for closing bags.



CLASS 20500 (left) **machines are heavy-duty, high production units for closing medium and heavy weight bags. Available with power-driven horizontal conveyor, inclined conveyor, or both; or with conveyor transmission unit only, for plant production line.**



STYLE 80600 H

Sewing Head (left) is designed for making tape bound closure on multiwall paper bags. Automatic tape clipper.

Union Special®

BAG CLOSING MACHINES

Send for Information

Union Special Machine Company
412 North Franklin Street, Chicago 10, Illinois

Gentlemen:

Please send me new Bulletin 200, "Union Special Bag Closing Machines."

NAME_____

COMPANY_____

ADDRESS_____